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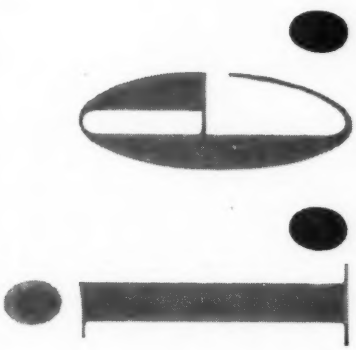

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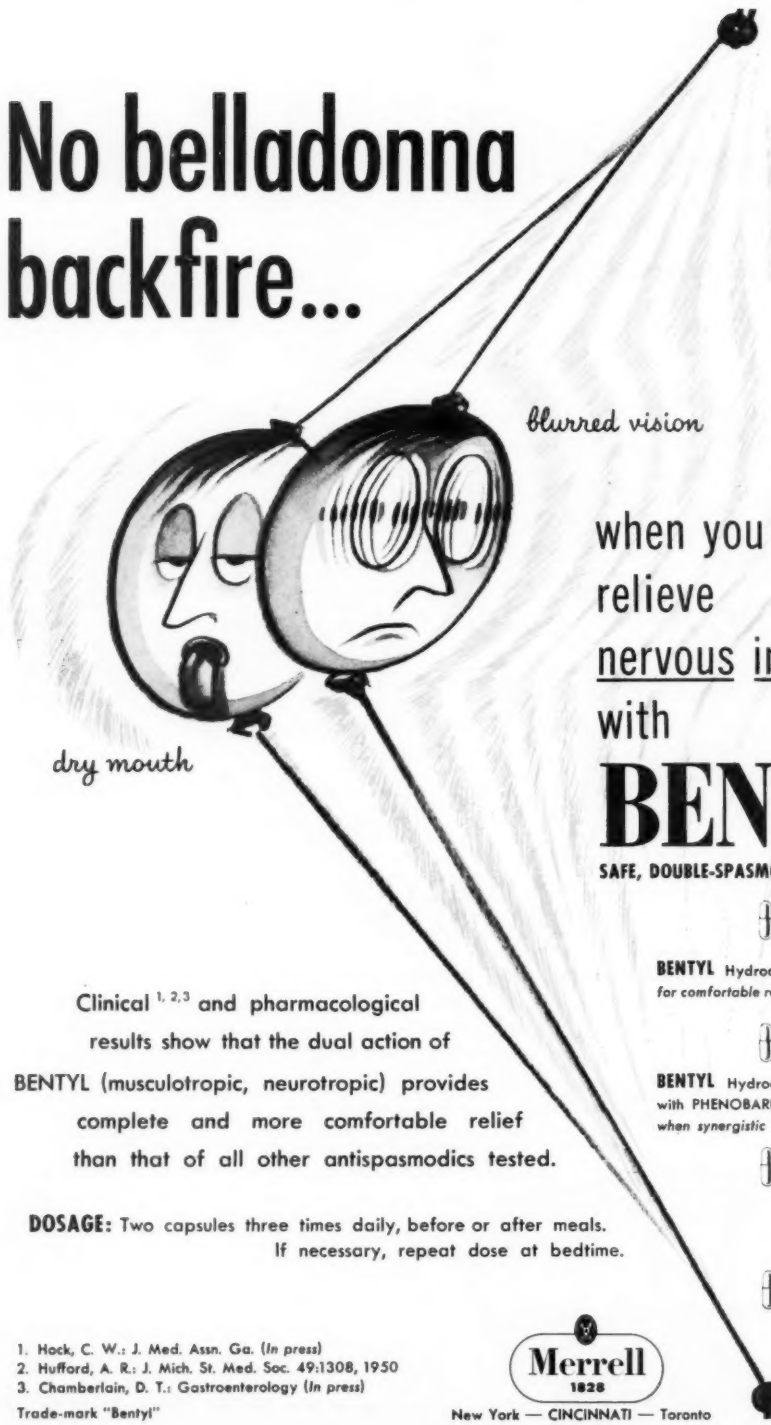

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2. Hufford, A. R.: J. Mich. St. Med. Soc. 49:1308, 1950
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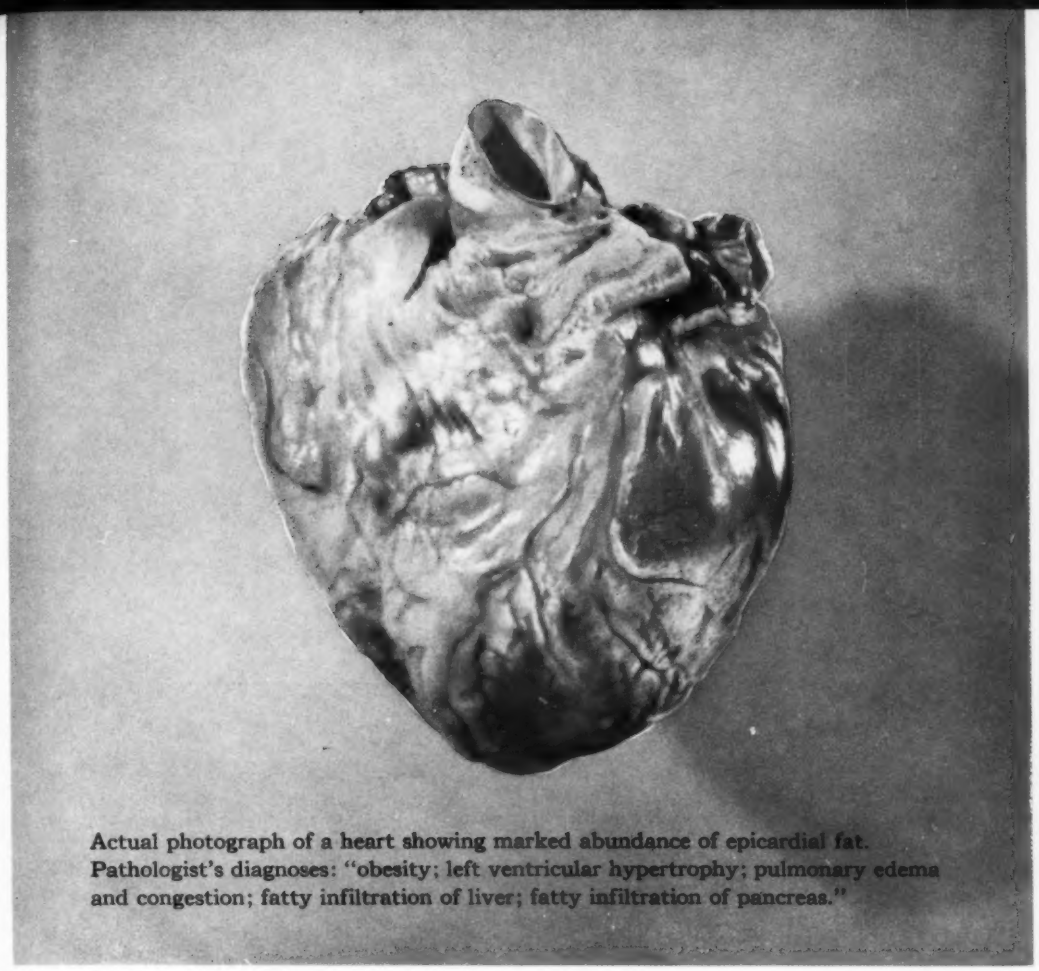

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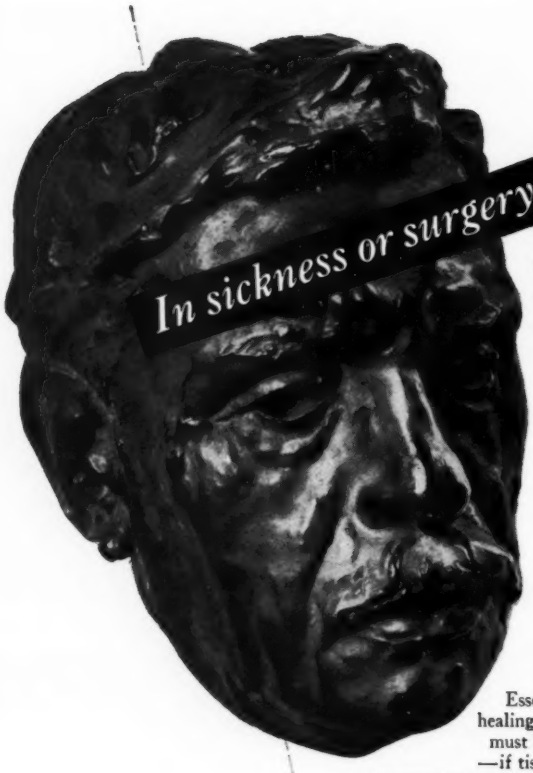

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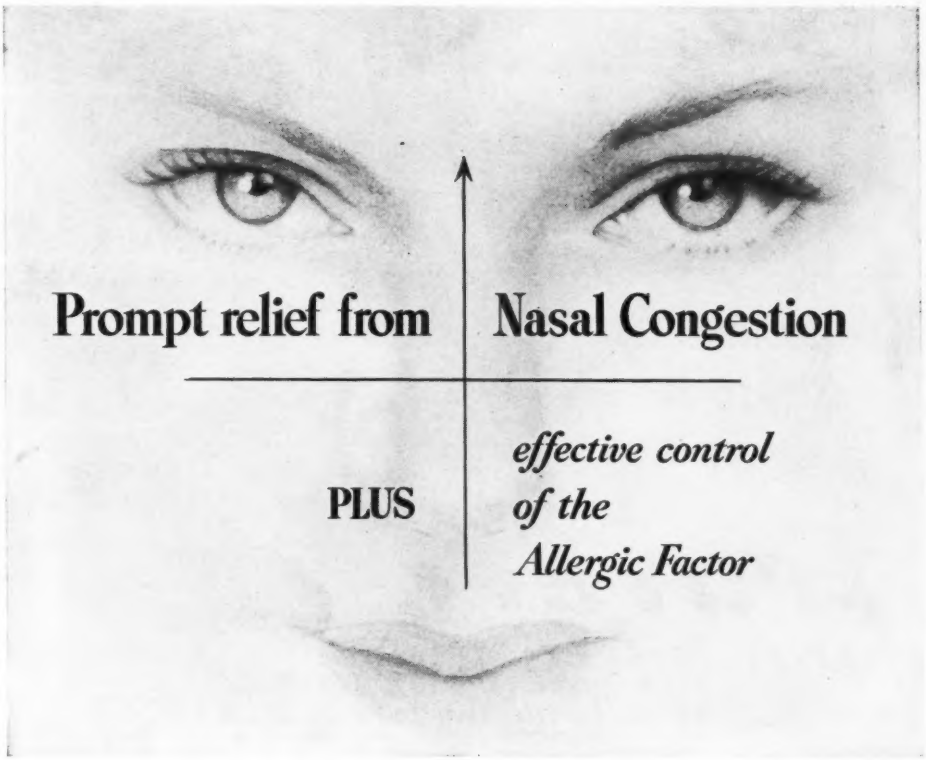

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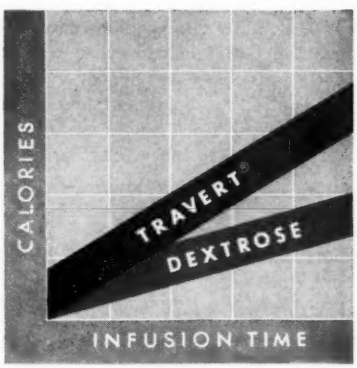

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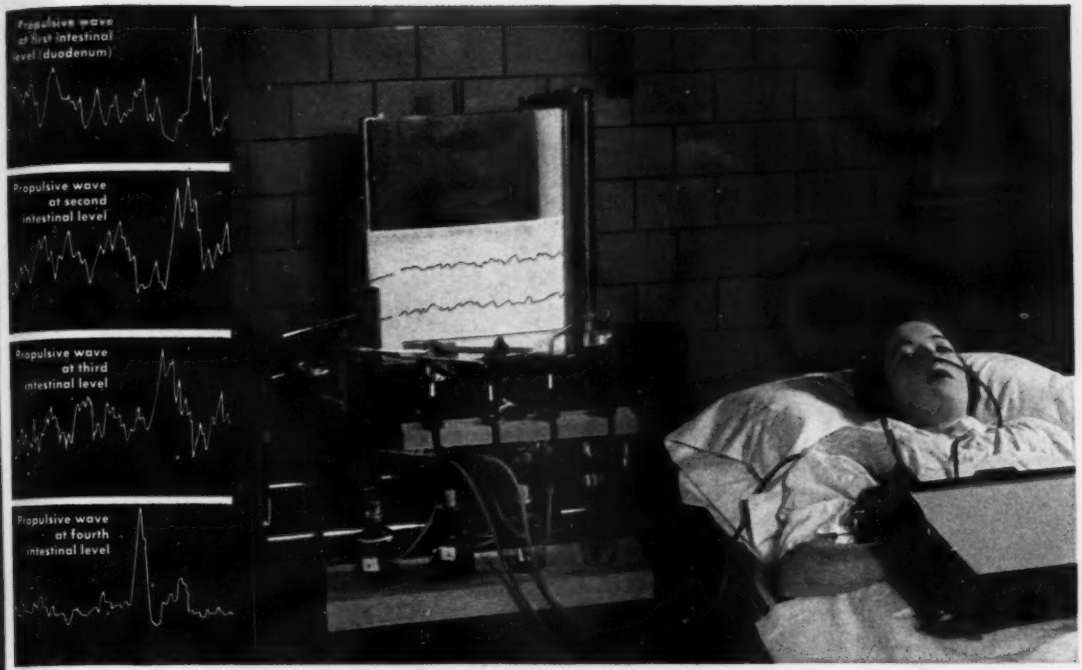
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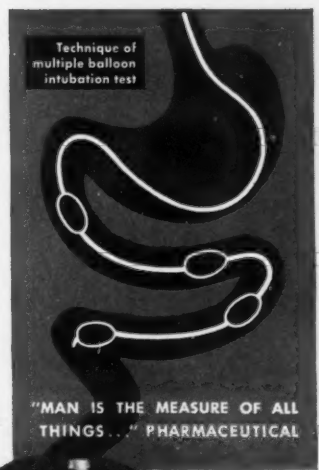


REFERENCES: 1. Chapman, W. P., Rowlands, E. N., and Jones, C. M.: New England J. Med., 243:1, 1950. 2. Kramer, P. and Ingelfinger, F. J.: Med. Clin. North America, 32:1227, 1948. 3. Posey, E. L., Bargen, J. A., and Dearing, W. H.: Gastroenterol., 11:344, 1948.

FORMULA: Each tablet, each capsule, and each 5 cc. (1 teaspoonful) of Elixir, contains 0.1037 mg. hyoscyamine sulfate, 0.0194 mg. atropine sulfate, 0.0065 mg. hyoscine hydrobromide, and 16.2 mg. (¼ gr.) phenobarbital.

A. H. ROBINS CO., INC., RICHMOND 20, VA.

Donnatal®

Robins

TABLETS • CAPSULES • ELIXIR

WHENEVER and WHEREVER spasm of smooth muscle causes pain or dysfunction

First aid for the *"digestive casualty"*

Entozyme greatly simplifies a broad therapeutic approach to many often complex disturbances of the gastro-intestinal tract, through its provision of potent amounts of the principal digestive enzymes: pepsin, pancreatin (with its lipase, amylase, and trypsin), and bile. Its special "tablet-within-a-tablet" construction controls the release of each essential digestive enzyme at its own appropriate gastro-enteric level... in its optimal state of enzymatic activity. This unique action explains the relief gratifyingly elicited in so many cases of pathologic or functional impairment of the digestive process.[1,2,3]

REFERENCES: 1. Kammandel, H. et al.: Bull. N. Y. Med. Coll., Flower & Fifth Ave. Hosps. (in press). 2. McGavack, T. H. and Klotz, S. D.: Bull. N. Y. Med. Coll., Flower & Fifth Ave. Hosps., 9:61, 1946. 3. Weissberg, J. et al.: Am. J. Dig. Dis., 15:332, 1948.

FORMULA: Each tablet contains 300 mg. pancreatin, U.S.P., 250 mg. pepsin N.F., and 150 mg. bile salts.

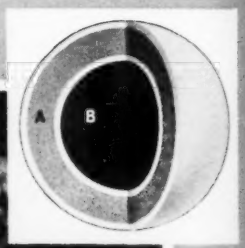
A. H. ROBINS CO., INC., RICHMOND 20, VA.

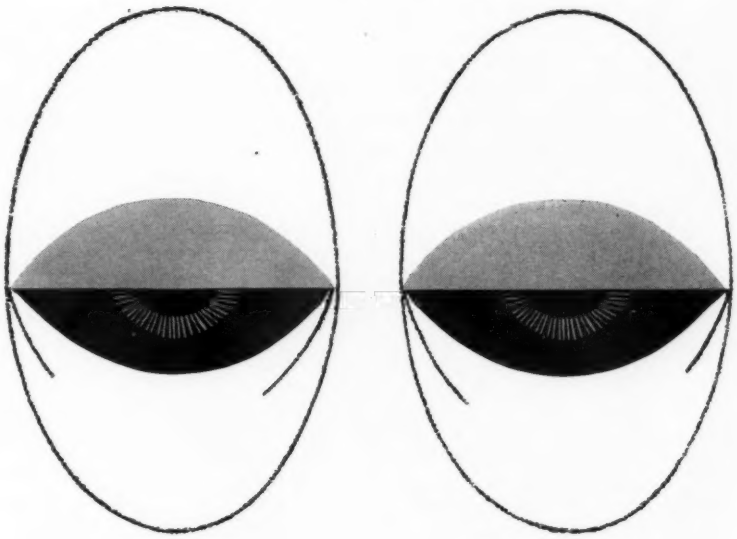
ENTOZYME®

Robins

A SINGULARLY effective, DOUBLE-layered tablet, with TRIPLE-enzyme digestive action.

Gastro-soluble enzymes are released from outer shell (A) *in stomach; entero-active enzymes from inner core* (B) *in duodenum and jejunum.*





when the patient isn't quite "up to snuff"...

a good tonic is often all that is needed.
To stimulate appetite, to restore vigor and general tone,
Eskay's NEURO PHOSPHATES and Eskay's THERANATES are two
of the most useful preparations you have. These tonics
are prescribed so widely because they work so well.
Both are available in 12 fl. oz. bottles.
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Eskay's Neuro Phosphates*

a palatable and effective tonic

Each adult dose, 2 fluid drams (2 teaspoonfuls), contains:	
Alcohol	10 per cent
Strychnine glycerophosphate, anhydrous	1/60 grain
Sodium glycerophosphate	2 grains
Calcium glycerophosphate	2 grains
Phosphoric acid, 75%	1.7 minims

Eskay's Theranates*

the formula of famous Neuro Phosphates, plus Vitamin B_1
(0.75 mg. each adult dose)

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Ammivin is pure khellin. This new weapon against angina pectoris and coronary insufficiency offers these advantages:

Ammivin is approximately five times as potent a vasodilator as aminophylline.

Ammivin is selective. Dilates the coronary arteries without appreciable effect on peripheral circulation—does not alter blood pressure •

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Ammivin is enteric coated •

Ammivin is the preferred dosage form of khellin •

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Ammivin

(pure khellin)

a potent coronary vasodilator

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More than Half a Century
of Service to the Medical Profession

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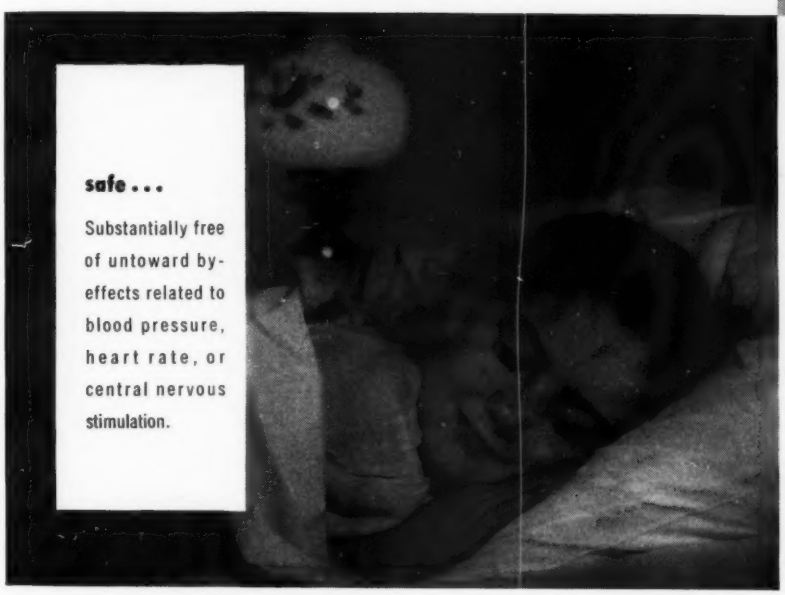

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EFFICIENT NASAL DECONGESTANT...
Relief begins in minutes—lasts for hours.

Because WYAMINE is notably free of undesirable side-actions common to other vasoconstrictors, it is SAFER to use in individuals suffering from high blood pressure, heart disease, diabetes, or thyroid disease.

Available as: SOLUTION WYAMINE SULFATE, *Bottles of 1 fl. oz.*
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Wyamine-Penicillin, *Capsules, Penicillin with Vasoconstrictor, for preparation of nasal solutions.*

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MEPHENTERMINE

N-methylphenyl — *tertiary* — butylamine WYETH

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Quality and Craftsmanship . . .

GELUSIL* *'Warner'*

Once in a long while a remedy is evolved which meets practically all of the medical requisites: effective, safe, and reliable. In the management of peptic ulcer or hyperacidic conditions, GELUSIL* 'Warner' by combining comparatively non-reactive aluminum hydroxide gel with magnesium trisilicate, provides the advantages of both:

Prompt action **Prompt relief**
Prolonged action **Prolonged relief**

without secondary acid rise, chloride depletion, or danger of alkalosis;
and, most important, there is practically no constipation.[1]

HOW AVAILABLE: GELUSIL* 'Warner,' the safe, effective and reliable antacid preparation is purely local and non-systemic in its action.

TABLETS—each containing magnesium trisilicate, 0.5 Gm (7.5 grains) and dried aluminum hydroxide gel, 0.25 Gm (4 grains): boxes of 50 and 100, and bottles of 1000 tablets.

LIQUID—magnesium trisilicate, 0.5 Gm (7.5 grains) and aluminum hydroxide, 0.25 Gm (4 grains) per 4 cc (1 teaspoonful): bottles of 6 and 12 fluidounces.

[1]Seley, S. A.: Medical Management of Pyloric Obstruction Resulting from Peptic Ulcer, *Am. J. Dig. Dis., 13*:238, 1946.

*T. M. Reg. U. S. Pat. Off.

WILLIAM R. WARNER
Division of Warner-Hudnut, Inc.
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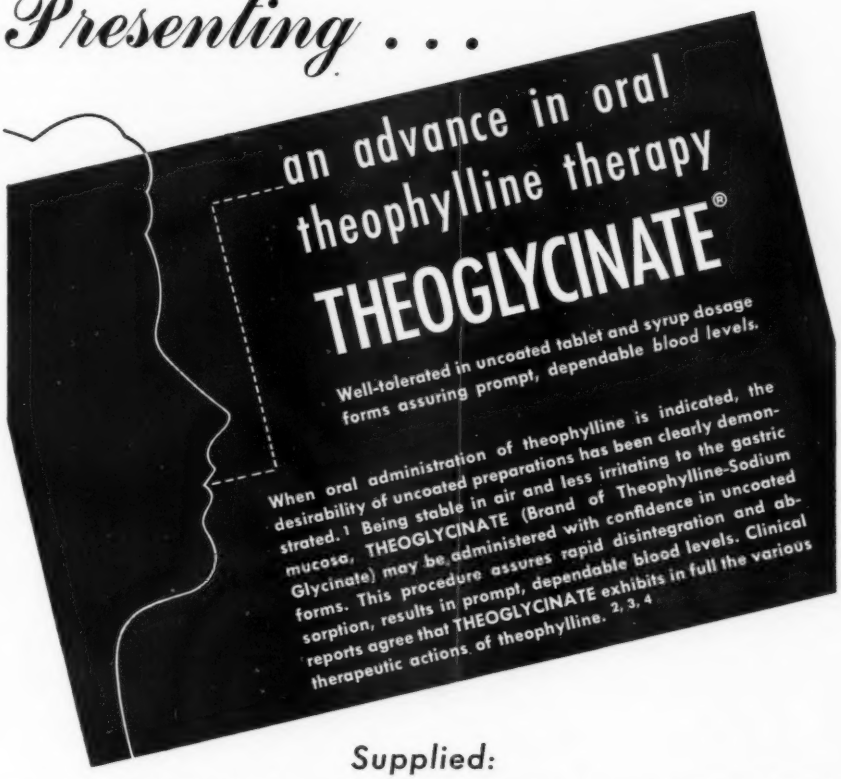
Presenting . . .


an advance in oral
theophylline therapy
THEOGLYCINATE®
Well-tolerated in uncoated tablet and syrup dosage forms assuring prompt, dependable blood levels.
When oral administration of theophylline is indicated, the desirability of uncoated preparations has been clearly demonstrated.1 Being stable in air and less irritating to the gastric mucosa, THEOGLYCINATE (Brand of Theophylline-Sodium Glycinate) may be administered with confidence in uncoated forms. This procedure assures rapid disintegration and absorption, results in prompt, dependable blood levels. Clinical reports agree that THEOGLYCINATE exhibits in full the various therapeutic actions of theophylline. 2, 3, 4

Supplied:

Uncoated Tablets in bottles of 100 (Each tablet: 5 grains Theophylline-Sodium Glycinate, equivalent 2½ grains Theophylline U.S.P.)

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Suppositories—Boxes of 12 (Each suppository: 12 grains Theophylline-Sodium Glycinate, equivalent 6 grains Theophylline U.S.P.)

1. Waxler and Schack, J.A.M.A., 143:736 (1950).
2. Bubert and Cook, Bull. Univ. Maryland Medical School, 32:175 (1948).
3. Paul and Montgomery, Jnl. Iowa State Medical Society, 38:237 (1948).
4. Krantz, Holbert, Iwamoto and Carr, J.A.Ph.A., 36:148 (1947).

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Chattanooga 9, Tennessee Dept. SM 1

Please forward to me free physicians sample and latest brochure on THEOGLYCINATE

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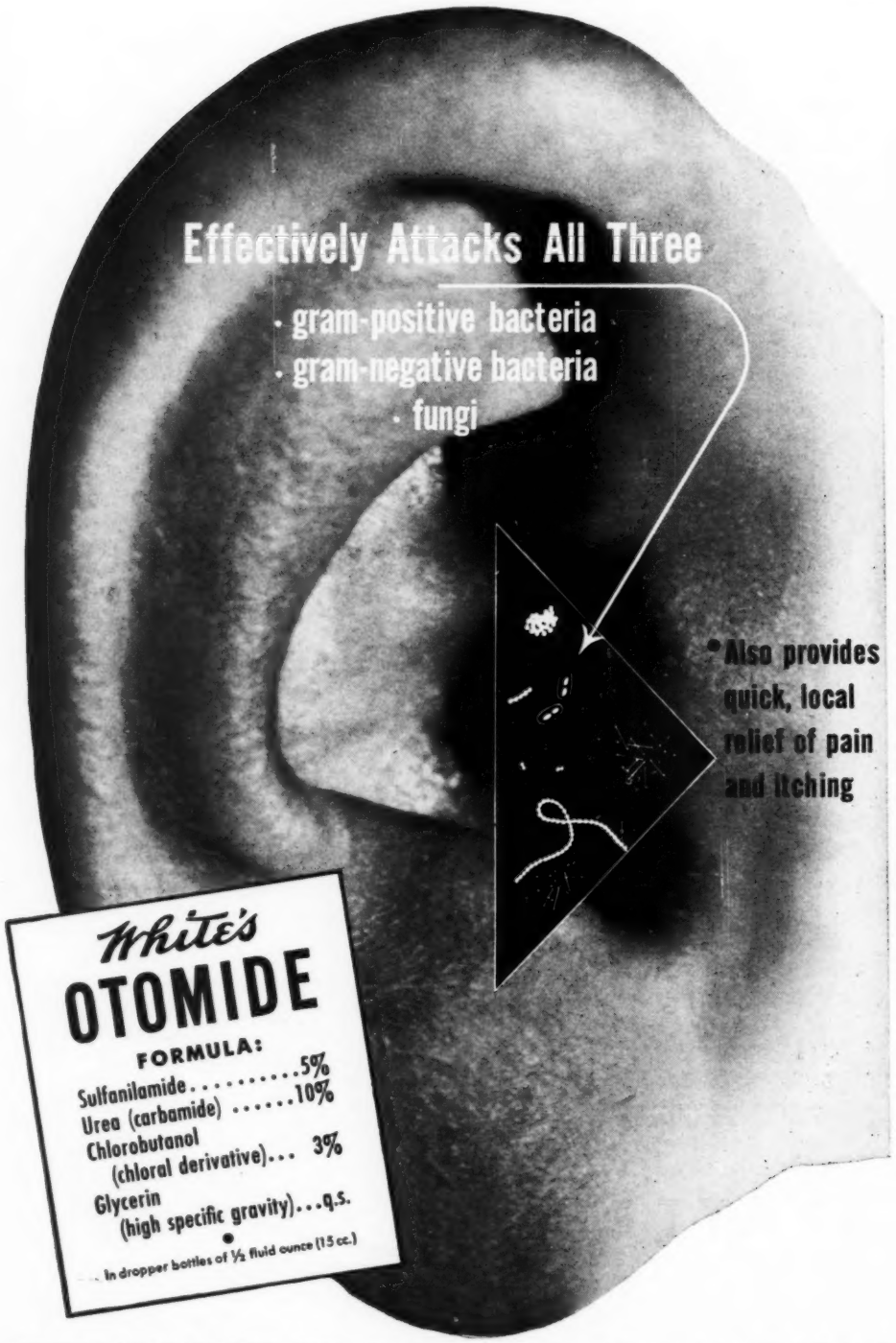

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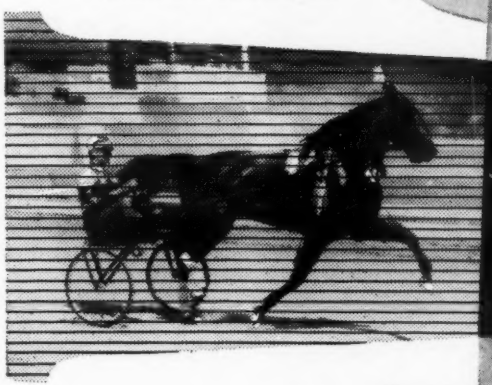
even in stubborn
slow healing **wounds**
burns
ulcers
(decubitus, varicose, diabetic)



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OINTMENT
the external
cod liver oil therapy

accelerates healing

New clinical studies[1] again prove the ability of Desitin Ointment to ease pain, inhibit infection, stimulate healthy granulation, and accelerate smooth epithelization in lacerated, denuded, ulcerated surface tissues . . . often in conditions resistant to other therapy.

protective, soothing, healing **Desitin Ointment** is a self-sterilizing blend of high grade, crude Norwegian cod liver oil (with its unsaturated fatty acids and high potency vitamins A and D in proper ratio for maximum efficacy), zinc oxide, talcum, petrolatum, and lanolin. Does not liquefy at body temperature and is not decomposed or washed away by secretions, exudate, urine or excrements. Dressings easily applied and painlessly removed. Tubes of 1 oz., 2 oz., 4 oz., and 1 lb. jars.

write for ***samples*** *and reprint*

1. Behrman, H. T., Combes, F. C., Bobroff, A., and Leviticus, R.: Ind. Med. & Surg. 18:512, 1949.

Desitin CHEMICAL COMPANY
70 Ship Street, Providence 2, R. I.

Because

patients can't

"SLEEP OFF" *hypertension...*

prolonged vasodilation is as essential at night as during the day. (One more reason why NITRANITOL is the most universally prescribed drug in the management of hypertension.)

NITRANITOL®

FOR GRADUAL, PROLONGED, SAFE VASODILATION

Merrell
1828
CINCINNATI • U.S.A.

When vasodilation alone is indicated. *Nitranitol.* (½ gr. mannitol hexanitrate.)

When sedation is desired. *Nitranitol with Phenobarbital.* (¼ gr. Phenobarbital combined with ½ gr. mannitol hexanitrate.)

For extra protection against hazards of capillary fragility. *Nitranitol with Phenobarbital and Rutin.* (Combines Rutin 20 mg. with above formula.)

When the threat of cardiac failure exists. *Nitranitol with Phenobarbital and Theophylline.* (½ gr. mannitol hexanitrate combined with ¼ gr. Phenobarbital and 1½ grs. Theophylline.)

"Of all the medications tried for treatment of the common cold during my thirteen years as Chief of Otolaryngology at this school*, [Par-Pen] has proved the most satisfactory."

Furlong, T.F., Jr.: Clinical Test of a New Spray, Arch. Otolaryng. 48:658.
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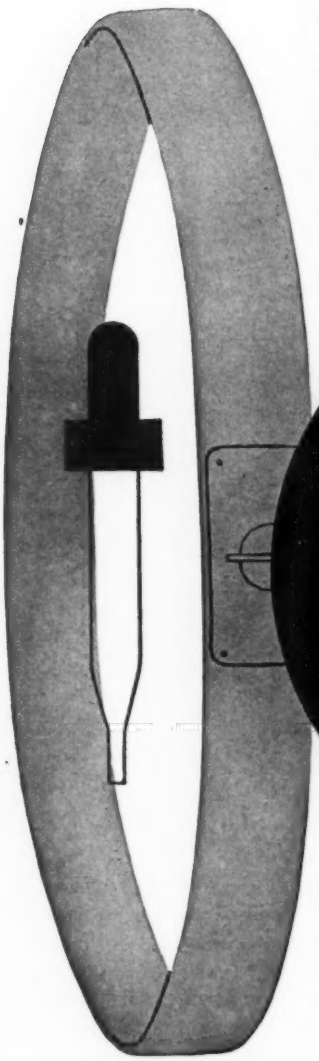

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DEEP PENETRATION Penicillin in solution penetrates the tissues more readily than the sulfonamides or tyrothricin, reaching deeply embedded organisms.

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Now packaged in convenient ½ fl. oz. bottles.

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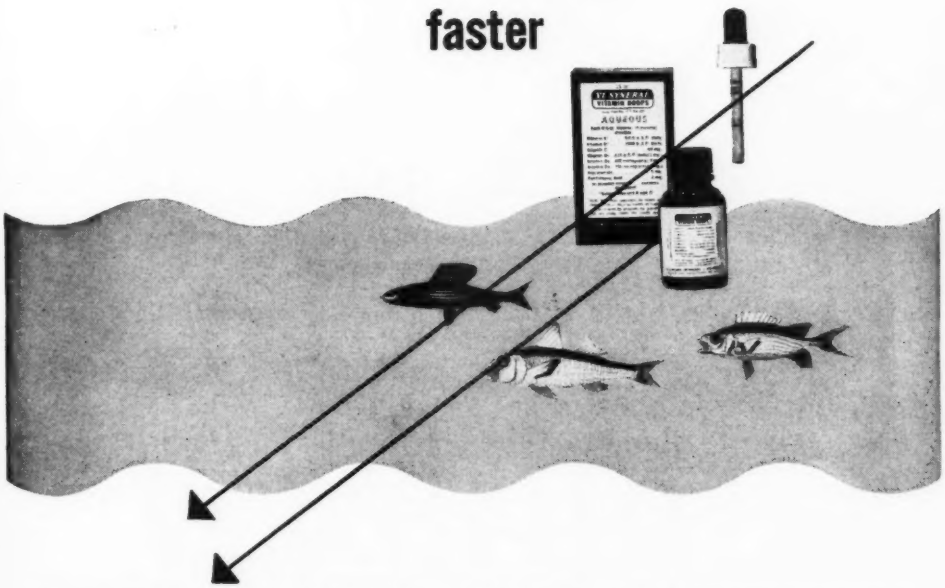

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CONTAINS 100% NATURAL VITAMIN D, THE SUPERIOR ANTI-RACHITIC

Great Advance in Vitamin Therapy . . . this oil-in-water solution developed by the Research Laboratories of U. S. Vitamin Corporation. Clinical literature* emphasizes the superiority of aqueous solutions of vitamin A compared to oily solutions (such as percomorph oils) . . .

500% GREATER ABSORPTION
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1/5th AS MUCH EXCRETION

Each 0.6 cc. provides:

VITAMIN A (natural)	5,000 units
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ASCORBIC ACID	50 mg.
THIAMINE	1 mg.
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RIBOFLAVIN	.4 mg.
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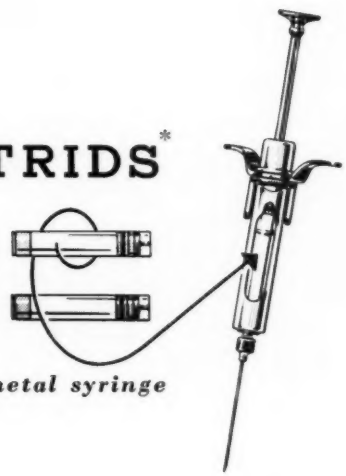
SAVE *time, motion, space*

with disposable **CARTRIDS***



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Detailed information and literature on Cartrids 'Duracillin A.S.' and Cartrids Dihydrostreptomycin Sulfate, Crystalline, Solution are personally supplied by your Lilly medical service representative or may be obtained by writing to

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* of either 'Duracillin A.S.' (Procaine Penicillin—G in Aqueous Suspension, Lilly), 300,000 units
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Each VERATRITE Tabule contains:
Veratrum Viride.....3 CRAW UNITS*
Sodium Nitrite.....1 grain
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*Biologically Standardized for toxicity. The CRAW UNIT is an Irwin-Neisler research development.
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In Mild and Moderate Hypertension, a marked sense of well-being is provided by the routine administration of Tabules Veratrite. Pronounced relief of headache, dizziness, fatigue and nervous irritability is accompanied with a reduction in blood pressure. Veratrite lessens peripheral resistance without compromise of circulation.
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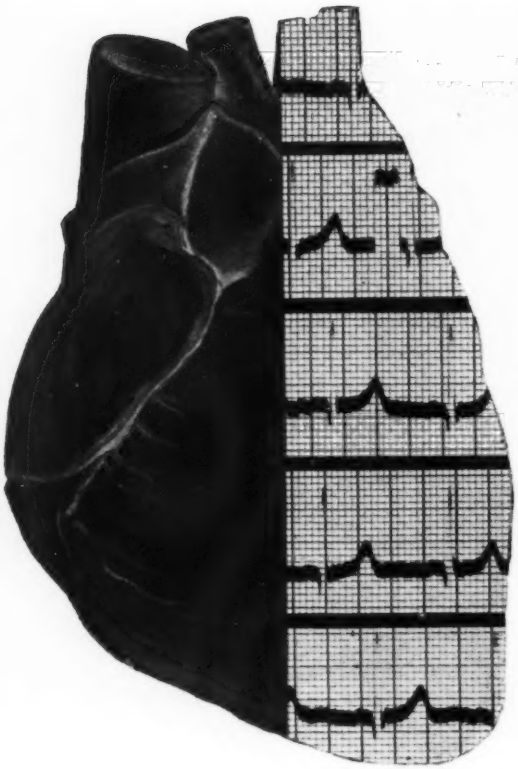

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finest of all

hypotensive

Sulfocyanates

"the only known substances which will, with reasonable safety and over an extended period of time, effect substantial reduction in blood pressure."[1]

All the hypotensive efficacy of the Sulfocyanates[1-3] (Thiocyanates) are available in HAIMASED in the first and finest Sulfocyanate **liquid** made in the United States. HAIMASED is stable, palatable, easy to take, sugar-free.

Properly adminstered, sulfocyanate therapy is "an effective drug for the control of high blood pressure in selected cases."[2]

Each 100 cc. of HAIMASED represents 4.4 Grams (20 grains to the fluid ounce) of Sodium Sulfocyanate.

1. Annals of West. Med. & Surg., 1:173, 1947.
2. Modern Medicine, 16:71, 1948.
3. Med. Clinics No. America, May 1949.

The TILDEN Company
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Samples and literature upon physician's request

Over 125 years of faithful service to the medical profession . . . by the oldest manufacturing pharmaceutical house in America. Founded 1824.

In Childhood Fevers—

The youngster with an acute febrile condition will be more cooperative if pleasant-tasting Aspergum is selected as the antifebrile agent.

Quickly soluble in the saliva and gastric juice, the acetylsalicylic acid in Aspergum reaches the blood stream rapidly.

Whenever aspirin is indicated, depend on Aspergum for ease of administration. Ethically promoted—not advertised to the public.

Each pleasantly flavored Aspergum tablet contains 3½ grains of acetylsalicylic acid—a dosage form uniquely fitted to childhood requirements.

aspergum

The symbol of
a standardized tablet
of natural

QUINIDINE SULFATE

When the physician specifies . . .

TABLETS QUINIDINE SULFATE
(DAVIES, ROSE)

. . . he is assured of dependability. They are made of the natural salt, qualitatively and quantitatively tested, and are alkaloidally standardized.

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a practical *step forward* in the therapy of rheumatic affections

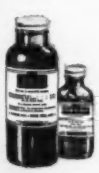
Pabalate usually provides better therapy for rheumatic affections than pure salicylate itself, through its mutually synergistic combination of para-aminobenzoic acid and salicylate.[1,2] Reports of authoritative clinical tests show a *higher* degree of pain relief... to *more* patients... on *lower* dosage... over *longer* periods... with *greater freedom* from adverse reactions.[3]

REFERENCES: 1. Dry, T. J. et al.: Proc. Staff Meetings Mayo Clin., 21:497, 1946. 2. Hoagland, R. J.: Am. J. Med., 9:272, 1950. 3. Smith, R. T.: J. Lancet, 70:192, 1950.

FORMULA: Each enteric-coated tablet or each teaspoonful of chocolate-flavored liquid contains 0.3 Gm. (5 gr.) sodium salicylate U.S.P., and 0.3 Gm. (5 gr.) para-aminobenzoic acid (as the sodium salt).

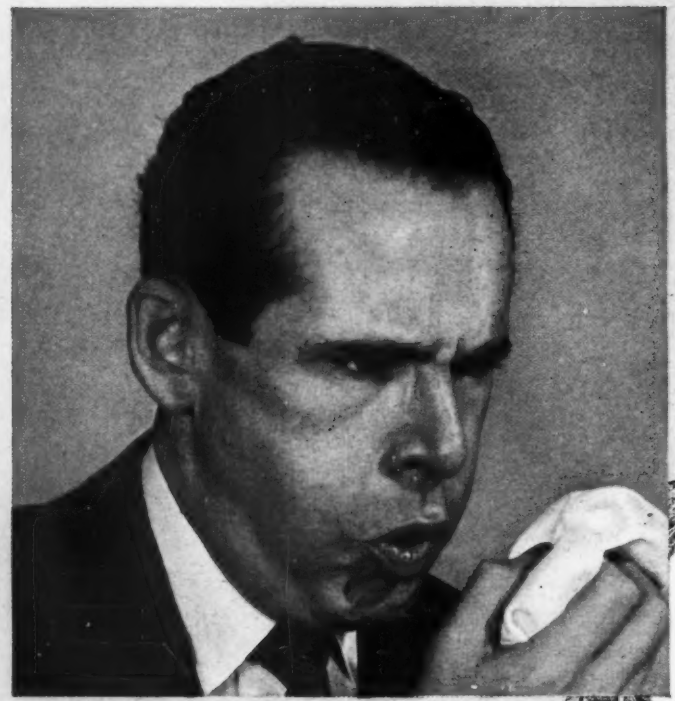
A. H. ROBINS CO., INC.
RICHMOND 20, VA.

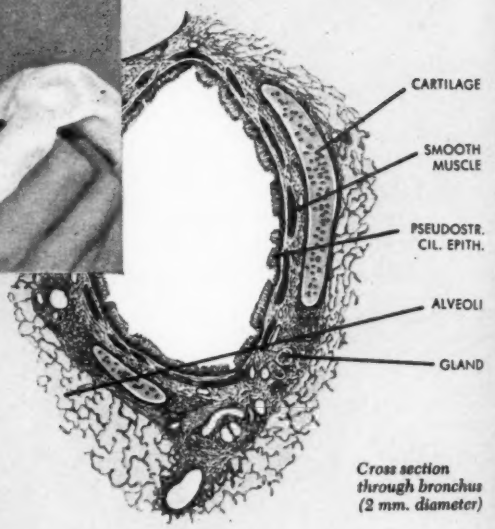
Robins **Pabalate®**



Seven Years' Research that opened a **New Era**

in Cough Therapy





Cross section through bronchus (2 mm. diameter)

The time encrusted *empirical* approach to cough therapy—with its "picture of confusion, contradiction and neglect"[1]—can now be replaced by sound, *rational* non-narcotic treatment, thanks to the pioneering studies of Boyd et al.,[1,2] demonstrating that glyceryl guaiacolate is the most powerful of expectorants commonly used. Robitussin—the antitussive-expectorant with specific drug action—provides glyceryl guaiacolate for increasing respiratory tract fluid, together with desoxyephedrine, for its bronchial-spasm-relieving[3] and its mood-improving actions—in an aromatic syrup that is highly patient-acceptable.

A. H. ROBINS CO., INC. • RICHMOND 20, VA.

Robitussin®

Robins

promotes useful cough... minimizes harmful cough

References:

1. Boyd, E. M. and Lapp, S.: J. Pharmacol. and Exper. Therap., 87:24, 1946. 2. Connell, W. F. et al.: Canad. M.A.J., 42:220, 1940. 3. Novelli, A. and Tainter, M. L.: J. Pharmacol., 77:324, 1943.

Formula:

Each 5 cc. (1 teaspoonful) contains 100 mg. glyceryl guaiacolate and 1 mg. desoxyephedrine hydrochloride, in a palatable aromatic syrup.

welcome relief in

head colds and sinusitis

We are sure you will agree that your head-cold and sinusitis patients will appreciate the prompt symptomatic relief provided by Benzedrex Inhaler.

By recommending Benzedrex Inhaler, you can keep them comfortable between office treatments. Benzedrex Inhaler provides rapid and prolonged relief from nasal congestion. Yet it does not produce ephedrine-like effects such as insomnia, restlessness and nervousness.

Your head-cold and sinusitis susceptible patients will be grateful to you for recommending Benzedrex Inhaler.

Smith, Kline & French Laboratories, Philadelphia

Benzedrex Inhaler

the best inhaler ever developed

'Benzedrex' T.M. Reg. U.S. Pat. Off.

WHEN *temptation* JOINS THE FAMILY

BORED, hungry, tired of dieting—what a perfect dish to set before temptation. And what better time to employ DESOXYN Hydrochloride? By its combined effect of depressing the appetite and elevating the mood, DESOXYN helps to quicken an interest in something besides eating, helps you encourage patient cooperation.

You'll like DESOXYN's prompt action, its long-lasting effect. And because DESOXYN is more potent, milligram for milligram, than other sympathomimetic amines, smaller doses produce the desired cerebral effect with a minimum of side-effects. One 2.5-mg. tablet before breakfast and another about an hour before lunch are usually sufficient. A third tablet may be taken in midafternoon if necessary.

Smaller dosage, faster action, longer effect—the next time you prescribe a restricted diet, keep in mind the name DESOXYN. Remember DESOXYN, too, whenever an effective cerebral stimulant is indicated. Available at your pharmacy. Abbott

For low-calorie diets, suggest

SUCARYL® Sodium • Abbott's new heat-stable, non-caloric sweetener

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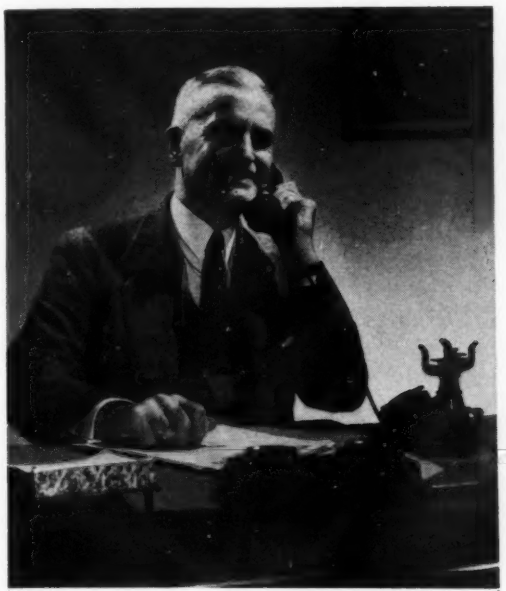
TABLETS	ELIXIR	AMPOULES
2.5 and 5 mg.	20 mg. per fluidounce	20 mg. per cc.

Patient's Business Activities



Uninterrupted

through

Gratifying Relief

of Urinary

Symptoms

An analysis of symptomatic relief in 118 cases treated with Pyridium shows:*

Urinary frequency promptly relieved in 85% of cases.

Pain and burning decreased in 93% of cases.

*Kirwin, T. J., Lowsley, O. S., and Manning, J.: Effects of Pyridium in certain urogenital infections, *Am. J. Surg.* **62**: 330–335, December 1943.

Under treatment for urinary tract infection, many patients are able to carry on their normal pursuits because of the analgesia produced with orally administered Pyridium. Pyridium can be administered concomitantly with antibiotics, the sulfonamides, or other specific therapy.

The complete story of Pyridium and its clinical uses is available on request.

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(Brand of Phenylazo-diamino-pyridine HCl)

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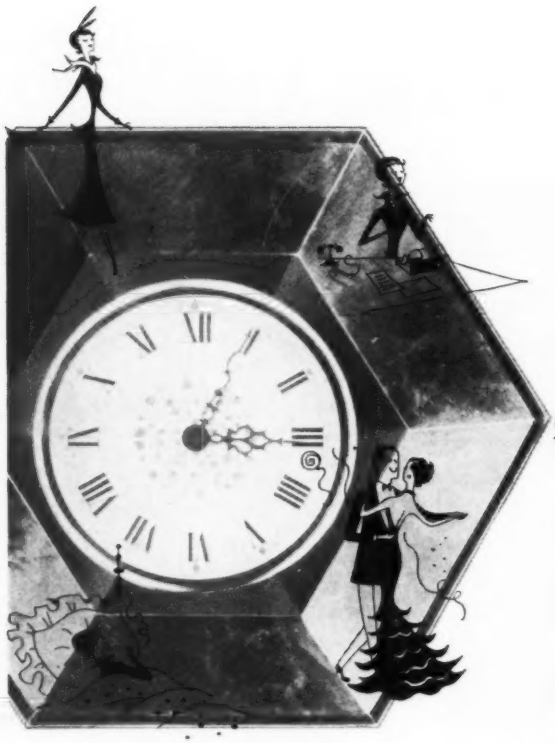

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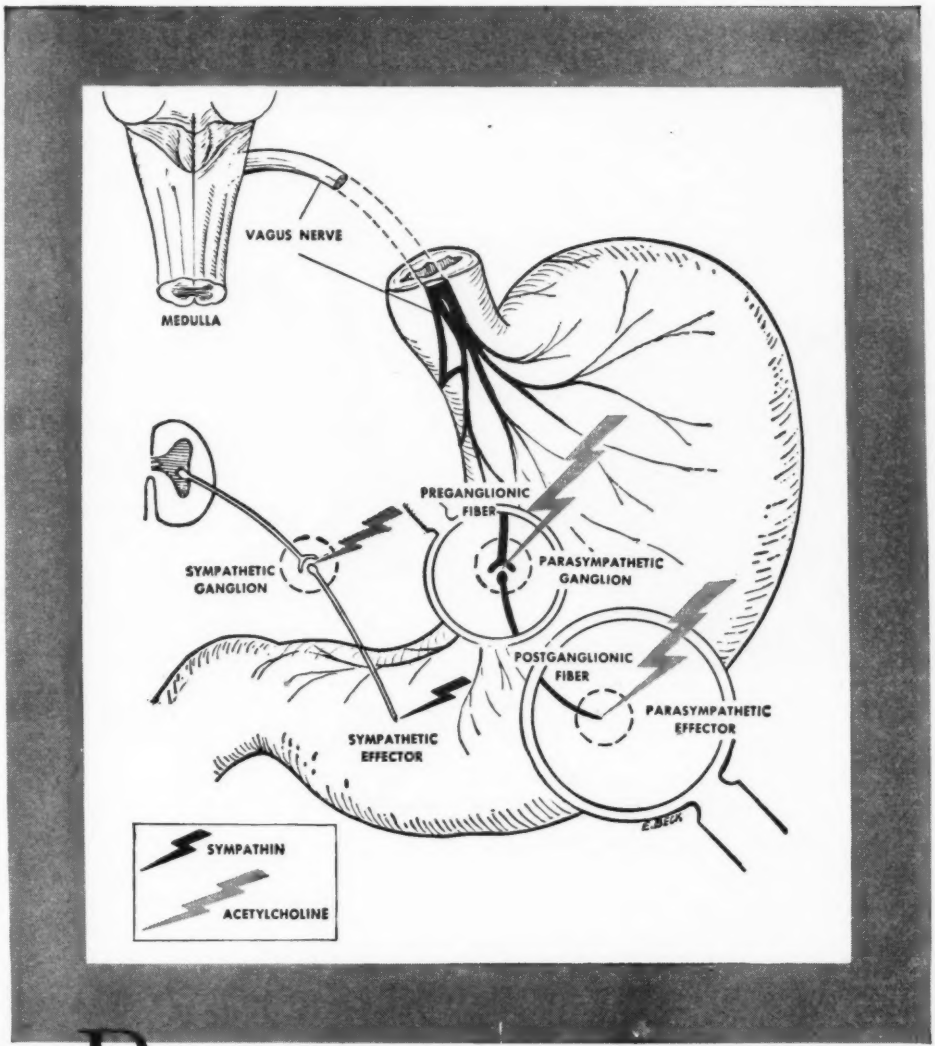

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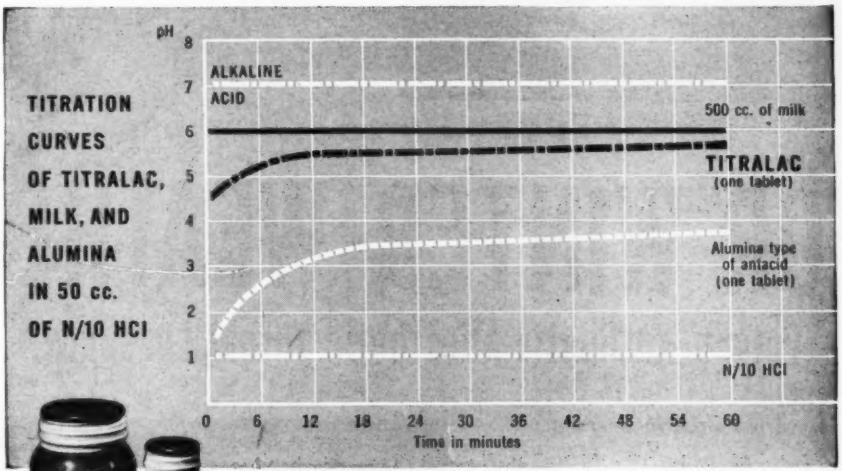

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REFERENCES

1. Rossett, N. E., and Flexner, J.: Ann. Int. Med. 18: 193 (1944). 2. Freezer, C. R. E.; Gibson, C. S., and Matthews, E.: Guy's Hosp. Reports 78: 191 (1928). 3. Aaron, A. H.; Lipp, W. F., and Milch, E.: J. A. M. A. 139: 514 (Feb. 19) 1949. 4. Kirsner, J. B., and Palmer, W. L.: Illinois M. J. 94: 357 (Dec.) 1948. 5. Kimball, S.: in Practice of Medicine (Tice). Hagerstown, Md., W. F. Prior Company, Inc., 1948; p. 210. 6. Special Article: M. Times 76: 10 (Jan.) 1948.

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1. Dieckmann, W. J., and Priddle, H. D.: Am. J. Obstet. & Gynec. *57*:541 (1949).
2. Chesley, R. R., and Annitto, J. E.: Bull. Margaret Hague Mat. Hosp. *1*:68 (1948).
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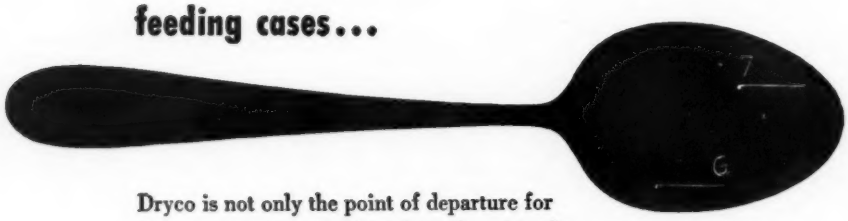

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*Pitt, C.K.: The Art and Science of Artificial Infant Feeding, J.M. Asso. Ala. 19:101 (Oct.) 1949.

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References . . .

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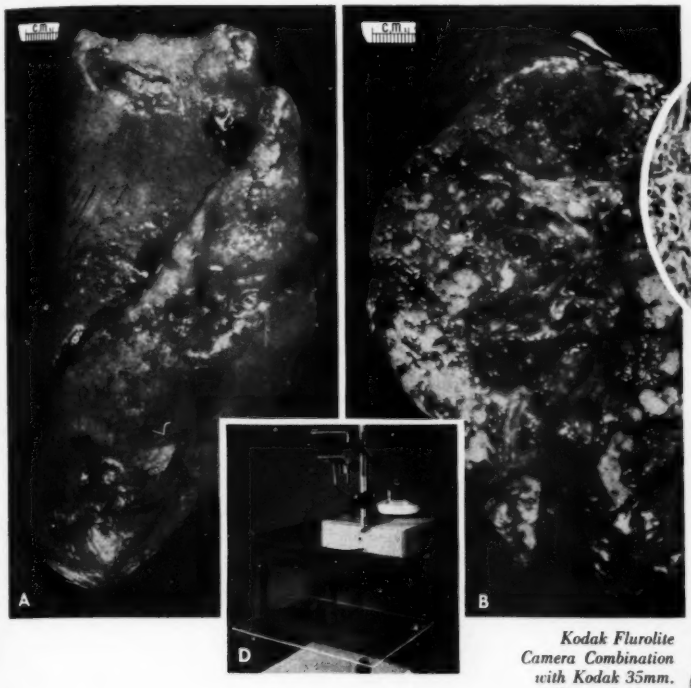
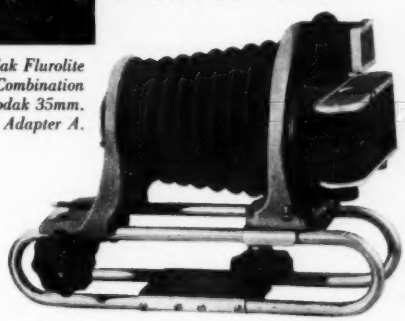


Reproductions A *and* B *show gross aspects of diseased lung after pneumonectomy. Reproduction* C *shows photomicrograph made from histological section of affected lung.*

Illustration D *shows setup of Kodak Flurolite Enlarger fitted with Camera components for the photography of gross specimens.*

Kodak Flurolite Camera Combination with Kodak 35mm. Film Adapter A.



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THE EFFECT OF X-IRRADIATION ON ERYTHROGENESIS, PLASMA AND CELL VOLUMES*

By JACOB FURTH, M.D.†
G. A. ANDREWS, M.D.
R. H. STOREY
and
LEON WISH
Oak Ridge, Tennessee

Erythrogenesis after radiation injury is both a theoretical and an applied problem. The amount of blood required to transfuse adequately the victims of a single atomic bomb explosion is estimated to be more than could be made available promptly by any of the collecting programs now under way. Depression of hemopoiesis post-irradiation sets a limit to radiation therapy of disseminated neoplasms. This report on recent research intends to show how the problems of postirradiation anemia are linked to those of capillary permeability and blood-clotting disturbances, and emphasizes the necessity of understanding the immensely complex pathology of the postirradiation state in order to arrive at a rational method for the control of anemia caused by irradiation.

In recent years, studies on the effects of irradiation emphasized less the direct action on circulating cells than the effects on hemopoietic tissue. Knowledge of the survival time of the various blood cell types has clarified the sequence of postirradiation changes in the blood picture and helped to correct earlier misconceptions about differences in the radiation sensitivity of the various blood cell types. Briefly, white cell counts drop rapidly because white cells have a short life span. Red cell counts drop slowly because erythrocytes have a long life span.

It is common clinical practice to evaluate the red cell picture by means of red cell counts, hematocrit and hemoglobin readings. If these are within normal limits, it is concluded that there is no red cell disorder. It has long been thought by some hematologists that such determinations alone may be misleading because they fail to take into account the total blood volume.† Obviously, without any change in the total number of red cells in the body, an increase in plasma volume may cause an apparent anemia and a decrease in plasma volume, an apparent polycythemia, such as occurs in dehydration. Since the red cell mass and plasma volume may change independently of each other, knowledge of both is needed in order to understand disorders of the red cell system.

In the course of our studies of endocrine influence on hemopoiesis, we frequently found that animals appeared anemic, almost exsanguinated, yet the total red cell mass was normal.[1] In the study of patients with varied disorders Lawrence[2] arrived at the same conclusion, namely, that red cell counts and hematocrits may be misleading and determination of the red cell mass is essential for the understanding of the state of erythropoiesis.[2] The term anemia itself requires a redefinition. It is best applied to indicate a reduced erythrocyte mass, while decreases in red cell counts or hematocrits are better designated as apparent or relative anemias.

In order to arrive at an understanding of the state of erythropoiesis postirradiation, the red cell and plasma volumes were determined in mice and rabbits exposed to a dose of x-rays lethal to 50 per cent of the animals (LD-50).

---

*Read in Section on Pathology, Southern Medical Association, Forty-Fourth Annual Meeting, St. Louis, Missouri, November 13-16, 1950.

*Work performed in the Biology Division of Oak Ridge National Laboratory under Contract No. W-7405-eng-26 for the Atomic Energy Commission.

*We wish to acknowledge the technical assistance of Miss Emma Jane Beale and Miss Mary M. Knoohuizen.

†Staff, Oak Ridge Institute of Nuclear Studies.

†After completion of this manuscript our attention was called to the excellent paper of P. F. Hahn ("The Use of Radioactive Isotopes in the Study of Iron and Hemoglobin Metabolism and the Physiology of the Erythrocyte," in Advances in Biological and Medical Physics, 1:287, Academic Press Inc., Publishers, New York, 1948) in which examples are given in discrepancies between red cell mass and hematocrit values.

The red cell mass and plasma volume changes in rabbits following exposure to LD-50 have been described elsewhere. There is a steady decline in red cell mass until about 9 days postirradiation, when recovery begins.[3] The plasma volume at first drops and later rises, so that the red cell counts and hemoglobin values which are expressed per cc. of the blood sample are misleading. The drop in the erythrocyte mass is at first masked by the simultaneous drop of plasma volume, whereas later it is exaggerated by the rise of plasma volume above normal. Thus the hematocrit readings are lowest on the seventeenth day. This explains the erroneous conclusion concerning irradiation anemia, arrived at by some earlier workers, (cf.[4]) who assumed that the drop in red cell mass starts about 4 days after massive irradiation.

A similar sequence of events has been noted in mice.[3] In these experiments the red cell mass was lowest 11 days and the hematocrit readings 15 days after irradiation.

The possible causes of the postirradiation drop in red cell mass are as follows.

(1) Death of aging erythrocytes.

(2) Direct injury to mature erythrocytes (cf.[4-6]).

(3) Indirect destruction of erythrocytes caused by alterations in the reticulo-endothelial system or by liberated injurious chemical substances (cf.[4-6]).

(4) Loss of erythrocytes due to internal or external hemorrhage (cf.[4-6]).

(5) Decrease or failure of red cell production.

Procedures used in the analysis of the pathology of an anemia of unknown cause are:

(1) A study of peripheral blood: cell counts, cell morphology, hemoglobin values, cell and plasma volumes.

(2) Assays of the degree of erythrogenesis: reticulocyte counts, section or biopsy of bone marrow, uptake of radio iron by red cells (cf.[2]).

(3) Assays of erythrocyte destruction: urobilin level in urine, bilirubin in blood, porphyrin excretion (cf.[6]), cell fragility tests, erythrophagocytosis in tissues.

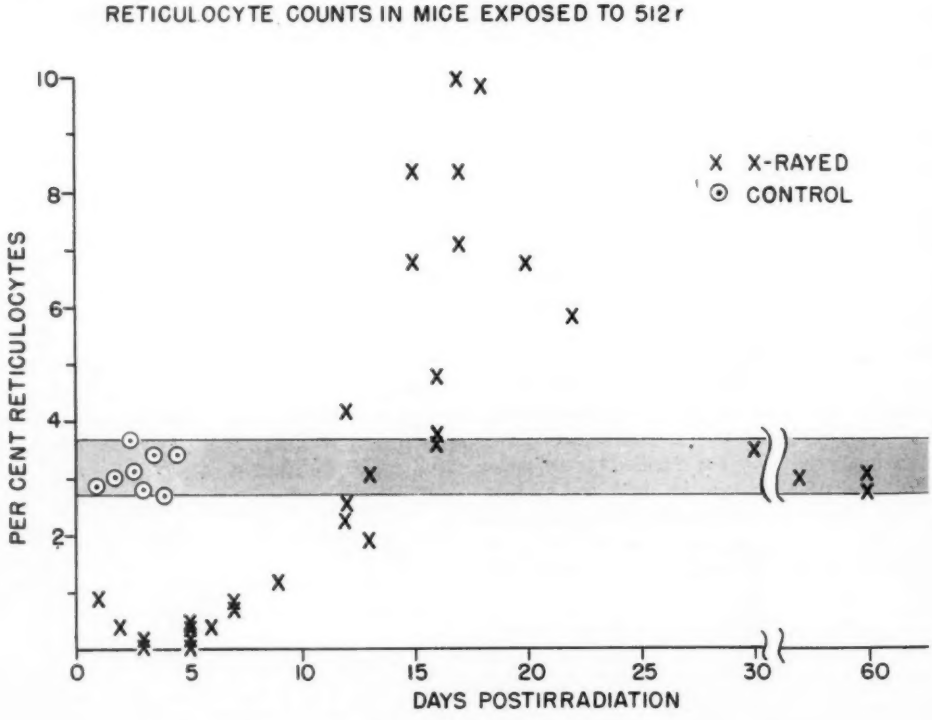


Fig. 1
Reticulocyte counts in mice exposed to 512 r. Each point is obtained on a different mouse.

Not all these determinations have been made thus far.

Reticulocyte counts indicate that erythrogenesis ceases within a day after irradiation and remains absent or at a very low level for about 12-14 days. *Fig. 1* shows changes in reticulocyte counts in mice following exposure to LD-50. Note the sudden drop following irradiation and the rise well above normal during the recovery period. A similar reticulocyte curve was obtained in mice exposed to equivalent doses of slow neutrons in the Oak Ridge pile (*Fig. 2*), and in rabbits receiving 800 to 1,000 r. of x-rays (*Fig. 3*). It is well known that during this period the bone marrow is profoundly depleted.

A new technic was developed recently by Hennessy (cf.[2]) to measure quantitatively the degree of erythrogenesis. A known amount of radio iron is injected intravenously and that taken up by red cells is proportional to the number of newly formed erythrocytes. This technic applied to different erythropoietic disorders in man yielded valuable information concerning the degree of erythropoiesis (cf.[2]). It is anticipated that the results yet to be obtained in irradiated animals will roughly parallel those of reticulocyte counts. Incidentally, this test is also suitable for determining the life span of erythrocytes.

Approximately one-half the total red cell mass disappears from the blood of rabbits in about 15 days and of mice in about 11 days after massive irradiation. The life span of mouse and rabbit erythrocytes is not known; but it seems to us that the drop in red cell mass is greater than could be accounted for by death of aging erythrocytes alone (cf.[6]).

In vitro erythrocytes are known to be resistant to irradiation by sublethal doses (cf.[5 6]), but there is evidence that *in vivo* erythrocytes are destroyed by similar doses. Postirradiation there is a rise in bilirubin excretion and massive erythrophagocytosis is seen in sinuses of lymph node and pulp of spleen, resulting in hemosiderosis (cf.[7]). The bilirubin rise and hemosiderosis could also be explained by accumulation of unused building stones of erythrocytes due to cessation of erythrogenesis, but the cause of erythrophagocytosis remains to be explained.

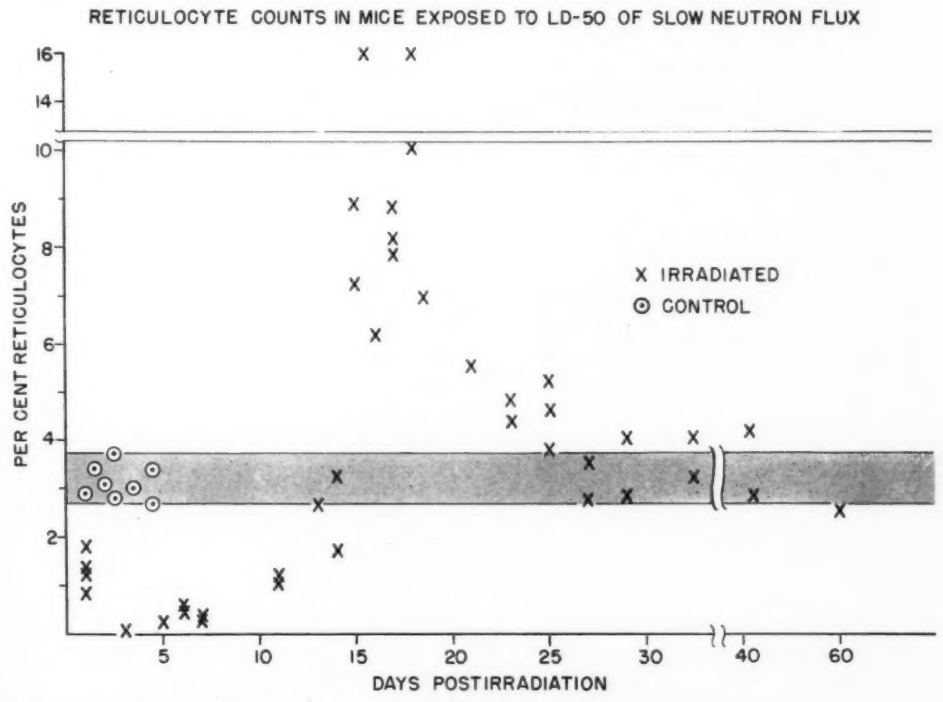


Fig. 2

Reticulocyte counts in mice exposed to LD-50 of slow neutrons in the Oak Ridge pile. Each point is obtained on a different mouse.

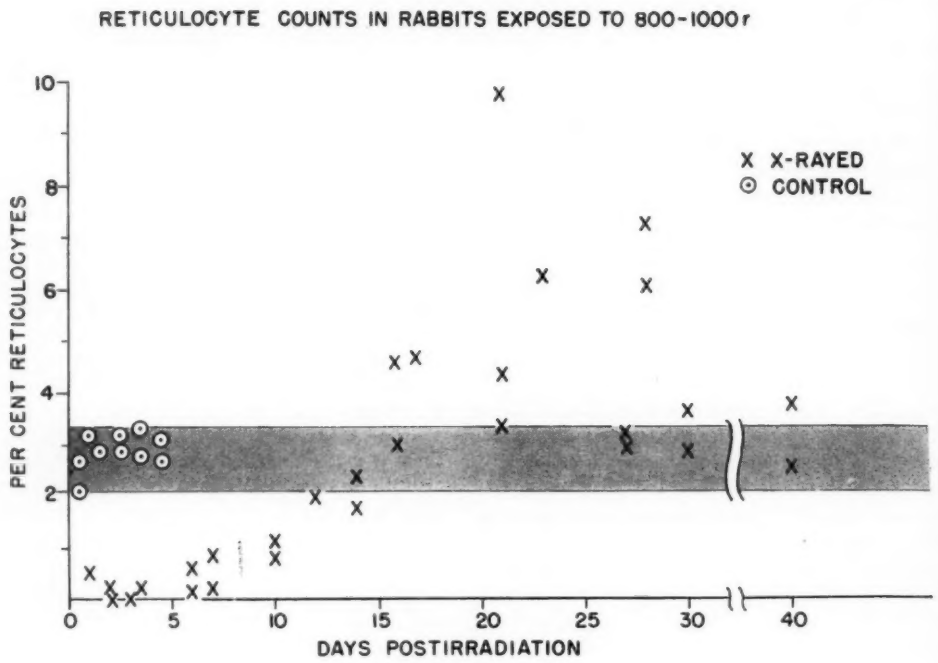


Fig. 3
Reticulocyte counts of rabbits exposed to 800-1,000 r. Each point is obtained on a different rabbit.

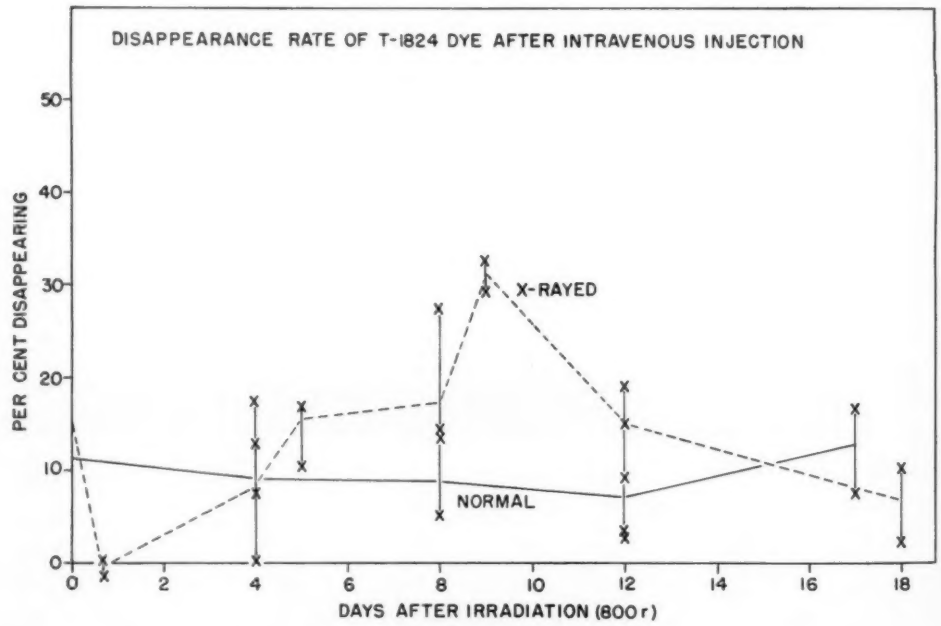


Fig. 4
Disappearance rate of T-1824 dye after intravenous injection in rabbits. In this experiment repeated determinations were made on the same rabbits on the days indicated.

The possibility that increased permeability of the capillaries or altered reticulo-endothelial function plays a role in the development of post-irradiation anemia led us to investigate the degree of capillary permeability in x-rayed animals by determining the rate of disappearance of various substances from the blood after intravenous injection. It was found that not only foreign substances but also homologous plasma tagged with ^{131}I and auto- and iso-erythrocytes tagged with ^{32}P disappeared from the blood of x-rayed animals faster than from that of normal animals.[8] *Fig. 4* shows the heightened disappearance of Evan's blue from the blood of x-rayed rabbits. This dye attaches itself to circulating proteins; thus its more rapid disappearance from the blood indicates heightened protein clearance.

Similar results were obtained with homologous plasma tagged with ^{131}I as shown in *Table 1*, indicating that this plasma disappeared from the blood of x-rayed rabbits faster than from that of normal rabbits. Even erythrocytes of x-rayed rabbits withdrawn and labelled with ^{32}P and re-injected into the same animal disappeared faster in x-rayed than in normal rabbits (*Fig. 5*).

Two possibilities were considered most likely to explain these results: heightened reticulo-endothelial function and increased capillary permeability.

In order to study quantitatively the degree of capillary permeability, the thoracic duct of dogs was cannulated by Bigelow.[9] In a manner recently described by Brown *et alii*,[10] but independently from them, he prepared in dogs lymphatic-venous anastomoses by introducing a cannula into the thoracic duct of dogs, another cannula into a branch of the jugular vein and exteriorizing the connecting loop for purposes of sampling. One such anastomosis was serviceable for 13 days. It came as a complete surprise to

DISAPPEARANCE RATE OF ^{131}I LABELED PLASMA IN X-RAYED RABBITS, EXPRESSED AS PER CENT DEVIATION FROM NORMAL

	Days after 1,000 r.											
Sex	1	2	3	4	6	7	8	9	11	13	15	21
♂	+ 92			+ 200					0	+ 49	+ 206	
♀ +	− 3	+ 39	+ 93	+ 23	+ 68	+ 7	+ 123	+ 39				− 6

Table 1

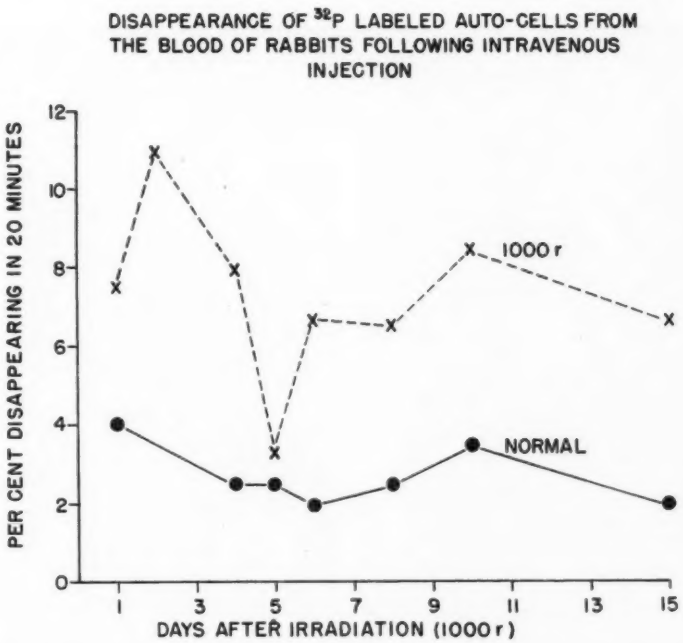


Fig. 5

Disappearance rate of erythrocytes of rabbits labeled with ^{32}P (autologous) from the blood after intravenous injection. Each point represents an animal.

us, although it should have been anticipated, that the lymph of x-rayed dogs was grossly bloody. Accordingly, all components of the circulating blood must pass the capillary barrier at a greater rate than normal. These experiments are in progress but the data obtained thus far indicate a greatly increased passage of erythrocytes from blood vessels to lymph spaces and explain the well-known but hitherto puzzling picture of massive erythrophagocytes in sinuses of lymph nodes. *Fig. 6* is a photomicrograph of a lymph node of a dog showing this change.

These observations led us to the hypothesis that one hitherto unappreciated factor of the postirradiation shock-like state is the subtle but widespread bleeding into lymph vessels and tissue spaces, which creates not only a drop of circulating red cell mass but also alters the internal milieu of tissue cells. The magnitude and consequences of this event remain to be studied.

The second possibility, that sublethal doses of x-rays alter the host, causing faster disappearance of erythrocytes tagged with radio iron, received support in current experiments with J. B. Kahn on the fate of irradiated and nonirradiated erythrocytes labeled with radio iron and injected into irradiated and nonirradiated hosts. These experiments indicate that the change causing increased red cell loss is for the most part due not to a direct effect of x-rays on erythrocytes

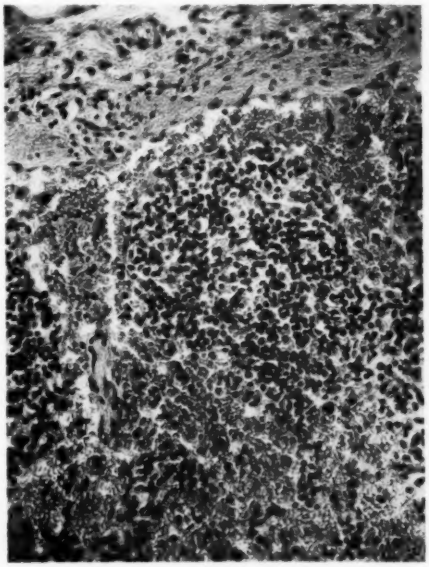
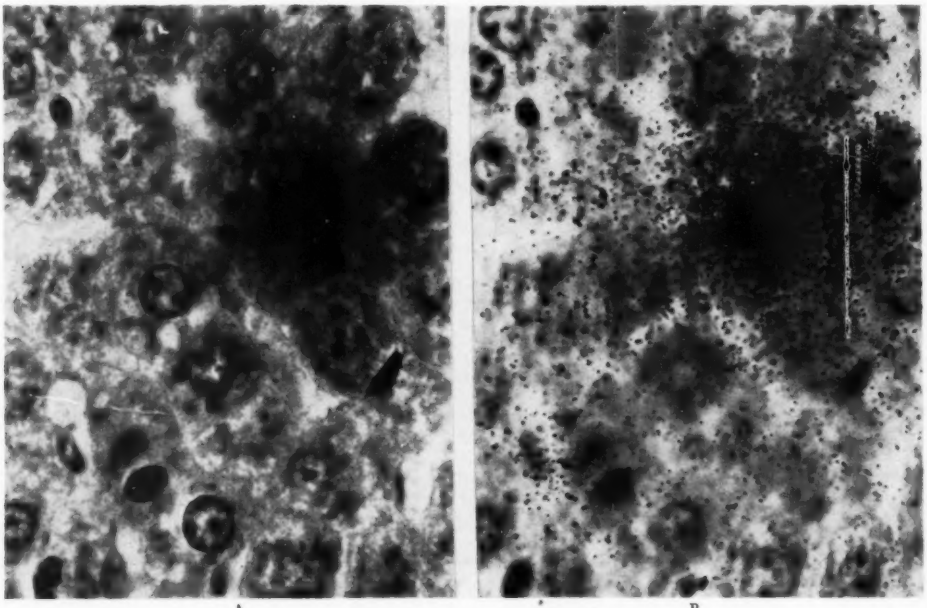


Fig. 6

Photomicrograph of a lymph node of a dog dying 14 days following exposure to 355 r. The peripheral sinuses are full of erythrocytes (magnification 150).



A B

Fig. 7

Radio-autograph of the liver of a mouse 15 minutes after intravenous injection of colloidal ^{198}Au. *Fig. A* is focused on the emulsion and shows a collection of reduced silver grains over a Kupffer cell which is focused in *Fig. B* (magnification 600).

but to some hitherto unknown change in the animal.

Several experiments were performed (in association with Sheppard and Wish) to obtain quantitative data on macrophage function in x-rayed animals. These will be more fully described.[8] Some illustrative results are as follows: colloidal gold, injected into the blood stream of mice, left the circulation faster in x-rayed than in normal animals (*Table 2*). Colloidal gold is selectively retained by the reticulo-endothelial system (illustrated in *Fig. 7*). Accordingly, this experiment was at first interpreted to indicate an increased reticulo-endothelial function in x-rayed animals.

Quantitative determinations were made of the amount of gold retained in various organs at various times after injection in normal and pre-irradiated mice. The results shown in *Table 3* indicate that the absolute amount of colloidal ^{198}Au retained in the liver and spleen is approximately the same in both controls and irradiated animals. However, since the weight of the spleen decreases markedly after irradiation, the amount of gold per gram of spleen is much greater in the irradiated animals. This and other similar experiments indicate that the macrophage function is not altered after irradiation, a conclusion recently arrived at by Barrow *et alii*.[11]

PER CENT OF COLLOIDAL ^{198}AU RETAINED IN RABBIT BLOOD AFTER INTRAVENOUS INJECTION

Days Post	Time After Injection			
	5 Minutes		20 Minutes	
1,000 r.	Normal	X-rayed	Normal	X-rayed
1	38.6	19.7	21.2	6.6
3	47.5	23.4	22.5	2.6
5	21.0	14.4	....	....
5	22.0	19.1	....	....
5	....	20.1	....	....
8	21.5	13.4	....	....
8	23.4	14.5	2.8	0.6

Table 2

PER CENT COLLOIDAL ^{198}AU RETAINED IN THE LIVER AND SPLEEN OF MICE 10 MINUTES AFTER INTRAVENOUS INJECTION

Animal	Liver			Spleen		
	Weight	Per Cent*	Per Cent g.	Weight	Per Cent	Per Cent g.
Control	1.52	92.3	57.0	.124	1.9	15.4
Control	1.65	95.7	57.7	.167	3.5	21.0
11 day post 620 r.	1.19	94.6	79.5	.053	3.7	69.8
620 r.	1.03	97.1	94.4	.053	2.5	41.7

*Per cent of injected dose.

Table 3

SUMMARY

The pathogenesis of postirradiation anemia appears to be as follows.

(1) After massive irradiation, erythrogenesis ceases almost immediately and is not resumed until after 7-14 days (as indicated by histologic studies of the bone marrow and reticulocyte counts).

(2) During this time there is a fall in total red cell mass as indicated by direct isotopic determinations. This fall is due: (a) to death of normally aging red cells with cessation of new cell formation, (b) to loss of red cells caused by heightened capillary permeability and secondary damage, and (c) possibly to other factors hitherto not recognized.

(3) Simultaneous changes in plasma volume mask the magnitude of drop in erythrocyte mass; and consequently red cell counts, hematocrits, and hemoglobin values do not indicate the exact degree of postirradiation anemia.

(4) Experimentally, the heightened permeability of capillaries following irradiation is indicated by rapid disappearance of various substances introduced into the circulation.

(5) Phagocytic reticulo-endothelial function is not markedly altered by irradiation.

(6) The hypothesis is advanced that continuous leakage of erythrocytes through damaged endothelium to tissue spaces and lymph channels is a major factor in the causation of postirradiation shock and anemia.

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STREPTOMYCIN AND PROMIZOLE IN THE TREATMENT OF TUBERCULOUS MENINGITIS IN CHILDREN*

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All current studies of the severe forms of tuberculosis in children, that is, miliary tuberculosis and tuberculous meningitis, continue to indicate that streptomycin in conjunction with either promizole or para-amino-salicylic acid exerts a favorable therapeutic effect on the disease.

So far only one previous study[1] has differentiated the results obtained in white and colored children. Since Brailey[2] has shown that colored children with tuberculous infection bear a more serious prognosis than do white, special emphasis in this paper is placed on results obtained in a relatively large number of colored children (16 cases). In order to give a complete picture of our series those white children so treated are also included.

Results.—Twenty cases of tuberculous meningitis have been treated on the Pediatric Service of the Medical College of Virginia Hospitals since October, 1947.† Of these, 16 were colored and 4 were white. At the present time 9 patients (6 colored and 3 white) are living at least 6 months following institution of therapy. There is no evidence of residual damage except for partial deafness in 3 cases. Six cases (4 colored and 2 white) have lived more than one year following diagnosis, and one of these appears to be well 3 years following inception of therapy. Six colored patients who received a full course of therapy died. Five patients, including one white child, were treated terminally and all died within 18 days. One of these lived only one day and two others lived only 5 days (*Table 1*).

Treatment. — In general the treatment used was a modification of that suggested by Lincoln and Kirmse.[3 4 5] Streptomycin or dihydrostreptomycin was given over a period of six months. However, we used a dosage schedule of 20-40 mg. per pound of body weight per day. A course of intrathecal streptomycin constituted 40 injections of 25-50 mg. each, given over a period of 9 weeks or less. A daily intraspinal injection was given for the first two weeks; after that time it was administered three to four times each week until a total of 40 injections was attained.

Promizole was given in dosage sufficient to maintain a blood level of 1-3 mg. per cent. Over how long a period of time this drug should be continued remains in question. Tentatively our aim is 3 years (*Table 2*).

Many modifications of the above schedule have been necessary. Signs of relapse often seemed to indicate another course of either intramuscular and/or intrathecal streptomycin therapy. In several of those patients who required repeated courses of therapy, intramuscular streptomycin was administered twice weekly.

Toxicity.—Toxic reactions in this group were relatively rare. Untoward reactions to promizole therapy included cyanosis, nausea and vomiting and anorexia. Several children showed a pink or red urine at some time during the course of promizole treatment. Contrary to other reports the goitrogenic effect of the drug was not significant in this series.

The toxic reactions to streptomycin have been adequately discussed in many other publications. Nausea and vomiting occurred in only one patient in our series. Another child had a temperature elevation following intrathecal injection of streptomycin. (This was the only instance in which intrathecal dosage was over 50 mg.). One

*Read in Section on Pediatrics, Southern Medical Association, Forty-Fourth Annual Meeting, St. Louis, Missouri, November 13-16, 1950.

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†Includes all hospital admissions prior to April 15, 1950.

child exhibited a marked vertigo and another both vertigo and ataxia which later completely disappeared. Four patients showed a marked loss of hearing during the course of treatment but improvement was noted in two of these following cessation of therapy.

Course of the Disease.—The course of the disease in this group of cases parallels that outlined by Lincoln and Kirmse.[3 4 5] However, one patient (L. M. S.) who had a relapse of tuberculous meningitis and severe pulmonary pathology necessitating lobectomy is reported in detail.

CASE REPORT

This 2½-year-old colored girl (*Figs. 1, 2* and *3*) was admitted to Dooley Hospital on October 9, 1947, with

PROGRAM OF THERAPY

Promizole
Sufficient dosage to maintain blood level 1-3 mg. per cent for 3 years

Intramuscular streptomycin
Dihydrostreptomycin
20-40 mg./lb. body weight per 24 hours for total of 6 months

Intrathecal streptomycin
40 injections of 25-50 mg. each over 9-week period

Table 2

DATA ON PATIENTS TREATED WITH STREPTOMYCIN AND PROMIZOLE
All statistics as of October 15, 1950.

Case	Age	Color	Sex	Duration Symptoms	Intramuscular Therapy (Days)	Intrathecal Therapy (Injections)	Diagnosis X-ray	Relapse	Results	Comments
1	5 months	C	M	2 weeks	5	5	Miliary	.....	Died 5 days	Terminal admission
2	2½ years	C	F	2 weeks	1	None	Mediastinal	.....	Died 1 day	Terminal admission
3	13 months	C	M	2 weeks	47	35	Mediastinal	.....	Died 51 days	Progressive
4	9 years	W	M	8 days	730	17	Mediastinal	.....	Died 18 days	Tbc. hip 2 years duration
5	19 months	C	F	10 days	14	11	Miliary	.....	Died 14 days	Terminal admission
6	1 year	C	M	3 weeks	48	39	Mediastinal, later miliary	.....	Died 51 days	Progressive
7	4 years	C	F	2 days	510	95	Tbc. pneumonia with cavitation	Yes	Living 3 years	Lobectomy L.L. lobe
8	8 months	C	M	4 days	132	59	Miliary	.....	Died 148 days	Progressive
9	3¼ years	W	F	2 weeks	150	40	Mediastinal	.....	Home living 10½ months	Had Tbc. otitis media 3 months before treatment
10	4 years	C	F	11 days	330	76	Mediastinal	Yes	Home living 21 months	Deafness clearing
11	15 months	C	F	2 weeks	120	40	Mediastinal	.....	Home living 12 months	Deafness clearing
12	18 months	W	M	4 weeks	133	50	Mediastinal	.....	Home living 24½ months	Deafness clearing
13	2 years	C	M	1 week	240	80	Mediastinal	Yes	Died while on therapy	Progressive
*14	8 years	C	F	1 week	300	67	Miliary	Yes	Died 11¼ months	Ataxic, with deafness
15	18 months	C	F	Unknown	285	41	Miliary	.....	Home living 13½ months	At home, appears well
16	3 years	C	F	Unknown	12	None	Miliary	.....	Died 12 days	Terminal admission
17	18 months	C	F	1 week	5	5	Mediastinal	.....	Died 5 days	Terminal, miliary on autopsy
†18	2½ years	W	M	5 days	120	33	Mediastinal	.....	Home living 24 months	At home, appears well
19	19 months	C	M	2 weeks	165	None	Tbc. pneumonia	.....	Living 6 months	Left hospital against advice
20	16 months	C	M	5 weeks	195	73	Miliary	Yes	In hospital living 6½ months	On therapy in hospital

*Patient left hospital against advice twice during treatment, the last time 15 days before death.
†Private patient of Dr. Hubert Dougan, treated at Johnston-Willis Hospital.

Table 1

a diagnosis of tuberculous meningitis. She was treated with streptomycin, 50 mg., intramuscularly every 3 hours for 95 days and was discharged. At that time she was clinically well, although the spinal fluid showed 42 white blood cells (6 neutrophils and 36 lymphocytes), protein 126 mg. per 100 cc., sugar 47 mg. per cent, and chlorides 616 mg. per cent. Two weeks later she appeared in the Children's Chest Clinic with signs of tuberculous meningitis. She was readmitted to the hospital and found to have severe meningeal involvement and a large area of increased density with two apparent areas of cavitation in the left lung base (also present on first admission). On streptomycin and promizole therapy the tuberculous meningitis was controlled. The spinal fluid showed only 50 mg. of protein and no cells on July 20, 1948. During the courses of intrathecal therapy she received a total of 85 injections of 25 mg. each.

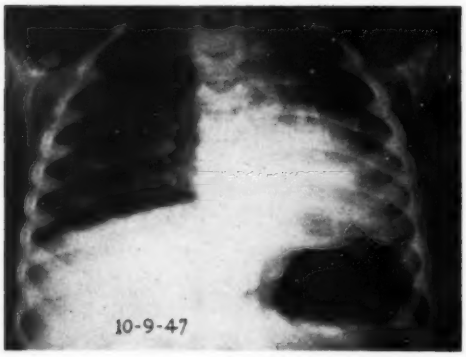

Fig. 1
Admission x-ray.

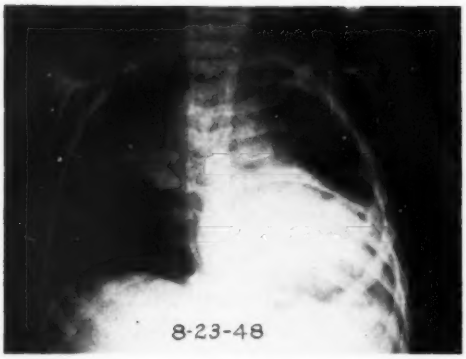

Fig. 2
Film on eighteenth postoperative day.

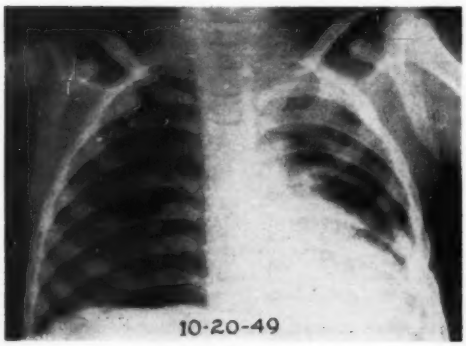

Fig. 3
X-ray two years after first hospital admission.

On July 27, 1948, bronchoscopic examination showed pus exuding from the lower lobe bronchus and direct smears from this area revealed the presence of the tubercle bacillus. The organism was also cultured from the spinal fluid and from gastric washings.

Surgical removal of the left lower lobe was performed on August 5, 1948, and following this an area of increased density appeared in the upper lobe of the right lung. In spite of these difficulties, however, the patient has made a recovery.

At present, 3 years following the initial diagnosis, 18 months following discontinuation of intramuscular streptomycin and 26 months after termination of intrathecal therapy, the spinal fluid shows no cells and the patient appears to be well. At a recent examination she was almost 6 years of age, weighed 38½ pounds and was 40¾ inches in height. She still received promizole.

DISCUSSION

There appears to be sufficient accumulated evidence to say that streptomycin has a beneficial therapeutic effect on tuberculous meningitis. Further, the work of Lincoln and Kirmse,[3 4 5] in particular, has indicated that combined use of streptomycin and promizole seems to be more effective than streptomycin alone. The effectiveness of this therapy is much more apparent in tuberculous meningitis in children than in adults.

In the combined Veterans Administration, Army and Navy report, Tucker[6] noted that 10 per cent or less of the cases of tuberculous meningitis survived as long as 18 months. The mortality rates in children are much more favorable. In a study of 29 cases MacArthur[7] reported 15 living from 3 to 12 months after inception of therapy. Rubie and Mohun[8] reported on 54 cases with 18 living after 8 months follow-up. Lincoln and Kirmse[3 4 5] followed 21 cases for 3 to 27 months and have had only 5 deaths. These and other authors have pointed out that the highest mortality rate in children occurs in those patients under 3 years of age.

In the only other study comprising a comparatively large number of Negro children (Levinson[1]) streptomycin was administered only by the intramuscular route and no intrathecal streptomycin therapy was used. Of the 15 colored patients in his group 6 were living 3 to 12

months after therapy was begun. In our series there were 16 Negro patients and only 6 of these are living 6 months or more after therapy was instituted. Of the 4 white children in our group 3 have survived more than 6 months and 2 of these have lived more than two years following onset of the disease. Two of the four white children in Levinson's series survived.

No conclusion can be drawn from the small number of cases reported here and in Levinson's series. They suggest, however, that tuberculous meningitis in the colored child has a higher mortality rate than in the white child. It may well be that this premise will be disproved when racial division is made in future reports. It is suggested, however, that such division be made in order further to clarify the question.

It is our feeling that intrathecal streptomycin therapy must still be considered a necessary part of the treatment of tuberculous meningitis. In 5 of our cases receiving intramuscular streptomycin there were physical signs and spinal fluid changes indicating relapse. Four of these cleared on a second course of intraspinal streptomycin treatment, although one of these later succumbed. Streptomycin by the intramuscular route reaches the spinal fluid in varied amounts, but that administered intrathecally produces a more satisfactory spinal fluid level.

Nine of the patients in this series had a miliary tuberculosis (one diagnosed at autopsy) in addition to tuberculous meningitis. Only two of these lived. Of the other 11 patients 7 are living. This suggests that the patient with disseminated tuberculosis bears a more serious prognosis, but again the number of cases is too small to draw conclusions.

Finally it must be realized that the mortality statistics included in this and other reports are not final. Many patients included among those living 3 to 6 months or more may yet die from tuberculous meningitis.

SUMMARY

(1) Twenty cases of tuberculous meningitis in children are reported.

(2) Of the 16 colored children, 4 have survived 12 months or longer following onset of the disease. Two have lived 6 months.

(3) Three out of 4 white children are living 6 months or longer following onset of the disease and two of these have lived more than two years.

(4) Streptomycin and promizole appear to exert a definite favorable effect on the disease. Until there is further evidence to the contrary, intrathecal streptomycin must still be considered a necessary part of the treatment.

(5) It is suggested that racial division be made in future reports.

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A POSITION OF VALUE IN STUDYING THE PELVIS AND ITS CONTENTS*

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Several years ago, in an attempt to gain further information with reference to the relative position of the sacrum and innominate bones, in cases of low-back pain, we recalled the appearance of the pelvis in radiography of experimental animals. It was impossible to duplicate this exactly but we found that a close approach could be arrived at by having the patient seated on the radiographic table in a sharply flexed posture, directing the central ray through the lumbar or sacral area, depending upon whether we wished to emphasize the anterior or posterior half of the pelvis. We obtained the same results by seating the patient on a small bench with a Lysholm grid and cassette under the buttocks. Technicians, however, soon established their easiest routine and this consists of placing the patient at right angles to the axis of the table at its midpoint with the popliteal areas closely applied to the edge of the table and the position of flexure maintained by grasping the ankles with the hands during the exposure.

*Chairman's Address, Section on Radiology, Southern Medical Association, Forty-Fourth Annual Meeting, St. Louis, Missouri, November 13-16, 1950.

Obviously the patient with pain finds this position a little difficult but even in these instances it is surprising that satisfactory flexion is possible when achieved gradually.

The film should be placed in the Bucky tray before the patient is placed in position since the lower extremities below the knees prevent access to the tray. A 14x17 film suffices to encompass all the structures satisfactorily if placed at right angles to the anterior-posterior plane of the pelvis, and this permits a symmetric projection of both hip joints and upper femora. The central ray routinely passes through the spine and sacrum unless for special reasons one wishes to deflect the spine to either side and to study the contralateral half of the pelvis.

Radiographic factors are practically the same as those which apply to a lateral projection of the pelvis and variations permit more detailed study of the bony structures or the soft tissues. In the average patient 100 ma., 40 inches distance, 80 kv., 5 seconds suffices. It should be borne in mind that the greater the flexure of the patient, the fewer ma. seconds are required.

It seemed scarcely conceivable that this position had not been used and referred to more often in the voluminous literature. The original reference[1] to this position occurs in the *Journal Radiology et d'Electricite* in 1923 and it is referred to in the textbook of x-ray diagnosis by Shanks, Kerley and Twining.[2] Hefke and Turner[3] refer to it in an article on "The Obturator Sign as the Earliest Roentgenographic Sign in the Diagnosis of Septic Arthritis and Tuberculosis of the Hip." J. H. Martin and E. R. Williams[4] employed it in studies on the "amount of radiation incident in depths of pelves during radiologic pelvimetry." More recently van Herrik and Good[5] refer to its use in roentgen measurement of the pelvic outlet.

Van Herrik and Good have made ample use of the term, "The Chassard-Lapine Technic," and we agree that since these French authors first described it in 1923, it should be so named.

It soon became apparent that the value of this projection in cases of sacro-iliac lesions is somewhat limited. It does serve, however, to delineate hypertrophic and eburnation changes in accessory articulations of the sacro-iliac areas and further uses may later be discovered. It affords a tangential view of the inner rim of the pelvis, depicts the acetabula in a plane at right angles to the anterior-posterior and does the same for the circumference of the femoral head and neck. At the same time it permits an easy projection of both sides of the pelvis for comparison as to symmetry and in children permits comparison of the epiphyses at the femoral head.

It is our conviction that the Chassard-Lapine position can be shown to have many uses. In

Fig. 1
Position of patient.

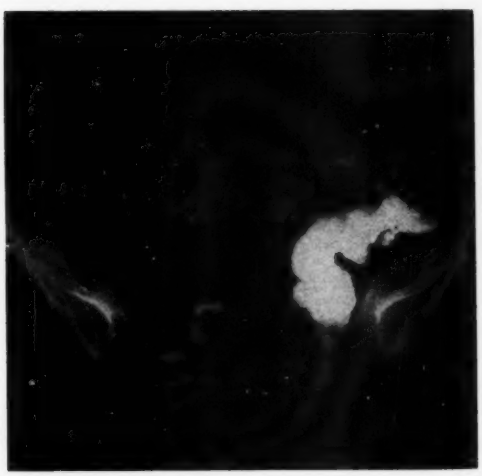

Fig. 2
Horizontal plications of large and small bowel.

urology it will be of value in demonstrating the ureters and their relationship to the bladder with asymmetries due to adjacent tumor locations. In hysterosalpingography it will give added information as to the shape and size of the uterine cavity and the location of the ovaries.

We have found no reference to its previous use with reference to the colon. This seems rather unusual because of all positions commonly employed, this position is most nearly conformative to that of the embryo and that most natural to study of the pelvis in lower animals.

Our interest has been concerned chiefly in its use with reference to the colon, particularly that borderline area between the realm of the radiologist and that of the proctologist. Most of us have at some time or other stated in our diagnostic reports that examination of the colon does not exclude disease of the rectum. Most of us have been puzzled to how whether the radiologic examination and the proctologic examination overlapped sufficiently to rule out the rectosigmoid area: that few centimeters just beyond the reach of the sigmoidoscope.

We are convinced that the principle of depicting the colonic plications in as many planes as

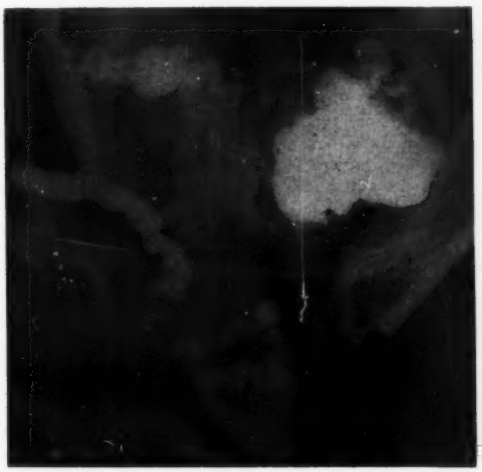

Fig. 3
Entire large bowel on one film including also nail in femur. Multiple bony structures also demonstrated.

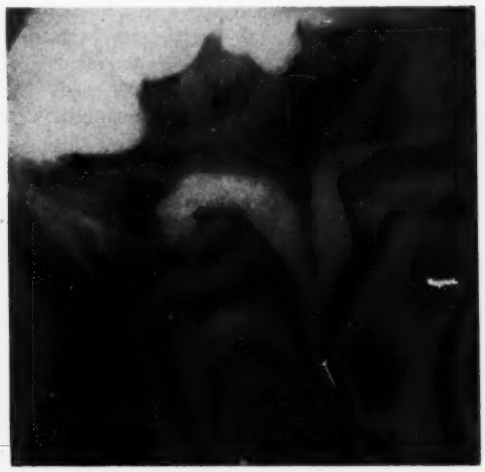

Fig. 5
Carcinoma of rectosigmoid and length of involvement determined.

Fig. 4
Displacement of colon by enlarged ovary or cyst.

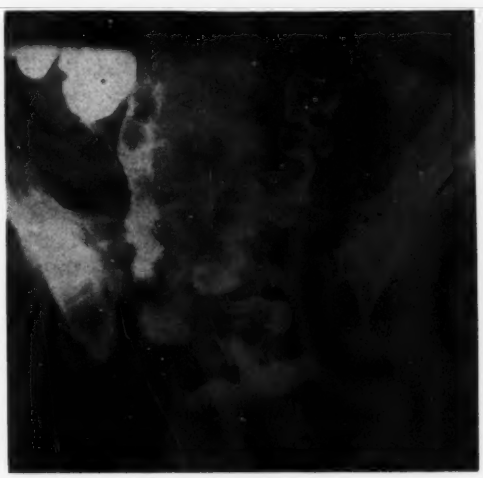

Fig. 6
Small polyps of anterior and posterior surfaces corroborated.

possible is justified. In no sense do we minimize the value of oblique projections in addition to the usual anterior-posterior, posterior-anterior, and lateral projections, but we have become increasingly aware that the folding and overlapping of coils of bowel occur in a horizontal plane and therefore, a projection at right angles to the usual angles must have value. In no way does it replace spot films, double contrast, careful fluoroscopy with rotation of the subject, but it does replace all stereoscopic procedures except that of the perfect double contrast procedure advocated by Dr. Stevenson and his group. Lateral projections of some segments of the colon require long exposure and high energy and here again we find that the disposition of the colon to fall into horizontal strata minimizes the value of the lateral projection. It affords an opportunity to study the anterior and posterior surfaces not otherwise gained.

The comment has been made that it is unnecessary because it covers a field which should be the domain of a proctologic or sigmoidoscopic examination. Unfortunately, we still have general practitioners who cannot use the proctoscope or sigmoidoscope well, and there are still those who do not use the examining finger. Many a fairly skilled proctologist informs us that his examination has been fraught with mechanical difficulties and as a result, his suspicion of a lesion in the rectosigmoid area is increased. The insertion of the sigmoidoscope allows vision of only one end of the lesion and distorts the topography. The visualization of the barium column in its longest axis affords the greatest accuracy as to size, length and shape of a lesion. Distortions by an extrinsic lesion are more accurately demonstrated.

In answer to the question: do we use it with the colon empty or full including barium enema or air, the answer is either or both. We have had no difficulty in retention where there is reasonable sphincteric control.

The inclusion of at least one study of the colon in the Chassard-Lapine position has become a routine procedure with us because of the fact that it often proves suspicious areas of incomplete filling to be normal and this we consider ample justification for its continued use, in addition to the many other procedures available.

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DISCUSSION (*Abstract*)

Dr. Thomas H. Lipscomb, Jacksonville, Fla. — Dr. Raap has presented a new approach to an old problem. He has shown that the pelvis and colon can look as different to you in this projection as does the skull, in a vertex view as compared with some of the more common views.

One reason why this method of examination of the colon has waited a long time with relatively little use is the technical factors. The bringing about of the rotating anode tube has permitted us to do an examination of this type, which would not be practical with the older types of tubes. It requires a relatively large amount of energy in a short enough time to avoid appreciable motion in the colon, to produce such excellent demonstrations as Dr. Raap has presented this morning.

I have used this position, particularly in studies of the pelvis where the outlet diameter was in question. I have also used it in the study of sacro-iliac joints. I have not used it much in the study of the colon. In that regard, I feel that the rotating anal tube has enabled us to do some other things, which were not practical with the older types of tubes, and with that in mind, I have looked at the patient from the rear, also. It is now routine procedure in my office, if the patient does not measure over 25 centimeters, to take not an anterior-posterior of the lumbar spine, but a posterior-anterior. That is also done in the cervical region in many instances. There, again, we benefit by the divergence of the rays, and, therefore, the shadows of the bodies of the vertebrae are more nearly projected squarely with reference to the axis of the vertebral bodies, rather than obliquely to them.

Dr. J. R. Maxfield, Jr., Dallas, Tex.—The use of pneumoperitoneum in the visualization of pelvic structure has been a procedure that has been overlooked considerably in general radiology. I think the addition of pneumoperitoneum to the films that Dr. Raap has shown would make a very definite contribution to the identification of structures such as the ovary. Also, where there is a question of an intrinsic lesion in the bowel as opposed to an extrinsic lesion causing pressure in the bowel, the use of pneumoperitoneum permits identification of the outward colon as well as the inside diameter. That might be of value.

Dr. Raap (closing).—In answer to Dr. Maxfield's question, I can see that the use of pneumoperitoneum in conjunction with this would be of definite value, and I hope that he will be able to show us some work at a later date to bear this out.

My reason for bringing this matter to your attention is chiefly this: here is a procedure which requires no extra equipment or trouble. A technician can do it, and,

as I said, we have found many instances in which there were questionable lesions and in which this procedure proved that they had no significance. That is the reason why it has become routine with us. This film affords the opportunity to make the diagnosis just a little more positive than it is without it.

VAGINAL URETEROLITHOTOMY*

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and
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Shaw's[1] article in 1936, was responsible for my first interest and knowledge of vaginal ureterolithotomy. In 1938, our first ureterolithotomy was performed by this route and in the twelve years that followed, our total has reached only 13 cases. For the usual review of this subject as regards historical facts, original technics and number of cases reported, reference should be made to articles by Shaw,[1] Bergman,[2] Garvey and Gomberg,[3] and Schroeder.[6]

In this paper, I wish briefly to review the anatomy and discuss the selection of cases, the present technic, complications, and report 13 additional cases operated upon by this method.

ANATOMY

Stones situated in the terminal two to three inches of the ureter in the female are much less accessible by any abdominal incision than they are in the male. The reason for this is that this portion of the ureter lies beneath the broad ligament and frequently will necessitate division of this latter structure to reach the stone. In Cobb's[5] article on this subject, the course of the distal ureter is described as follows:

"In the female, the ureter runs forward and inward beneath the broad ligament, passing beneath the uterine vessels and lying about 2 cm. from the side of the uterus at the level of the internal os. Emerging from the anterior surface of the broad ligament, before entering the bladder, it passes obliquely across the anterolateral vaginal wall with which it is in direct contact. During this part of its course, it is not covered with peritoneum, but is loosely supported by connective tissue."

It is stones situated in this portion of the ureter, which has emerged from the under surface of the broad ligament and is in direct contact with the anterolateral surface of the vaginal wall, that are readily accessible by the vaginal approach.

The type of case suitable for vaginal ureterolithotomy is most difficult to approach from any abdominal incision. Any case that is reasonably easy by the usual abdominal incision is almost impossible to remove by the present-day technic of vaginal operation. This simply means that if the stone is more than 5-6 cm. from the ureteral orifice, it would be difficult or impossible to remove vaginally, and should be approached from above. Another factor to be considered is whether or not the stone is palpable *per vaginam*. If the stone is not palpable, it should by all means be fixed by one or more catheters. Even when the stone is palpable, it may slip up the ureter during the operation unless fixed by catheters. This is especially true if the ureter is markedly dilated.

Most authors on this subject have not been inclined to use this approach on nonparous individuals. However, according to Lower, this is not a contraindication. Our *Case 6* was nulliparous and although no unusual difficulty was experienced, we did open the bladder. This mishap could not be blamed upon the fact that she was nulliparous, as room was adequate. In older women who have not borne children, some type of episiotomy would probably be necessary.

Obesity and previous abdominal operations favor the vaginal approach provided of course, the stone is situated low enough in the ureter. Patients who are considered exceptionally poor risks will tolerate this type of operation better than the abdominal approach because of the almost complete lack of shock with the former.

TECHNIC

In this series of cases, we have employed the technic described by Shaw with some minor changes. It is as follows:

When possible, one or more indwelling catheters should be introduced before operation for the purpose of fixation of the stone and to aid in locating the ureter. A stilette is left in at least one catheter, since it serves to help keep the catheter in place and further facilitates identification of the ureter. Where it has been impossible to pass a catheter before operation, a last attempt is made while the patient is relaxed from the anesthetic. It is advisable to make a final x-ray after these catheters have been passed.

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The patient is placed in the extreme lithotomy position and the pelvic examination made to ascertain whether the stone is still palpable. The vaginal vault is exposed and the cervix is grasped with a tenaculum forceps and downward and lateral traction are made in the opposite direction from the side of the stone. An incision is then made in the anterolateral vaginal vault, extending from its junction with the cervix to the lateral wall of the vagina. An attempt is made to place this incision as directly underneath the stone as possible, as this results in less interposition of soft tissue between the incision and the part of the ureter containing the stone. Shaw recommends placing sutures through the margin of the vaginal incision on each side to be used for retraction. Garvey[4] has improvised a special retractor which serves to hold open the vaginal incision and at the same time pull the operative field closer to the vaginal orifice. We unfortunately did not avail ourselves of these retractors in time to use them on any case of this series.

It is important that the entire length of the incision in the vaginal vault be made not by scalpel, but that the length of the incision be increased by actually stretching the original opening. This lessens the chance of cutting any large vessels. Once the vaginal incision has been made adequate, blunt dissection is carried out in a posterolateral direction through the soft tissues, in an effort to get above the stone. In this way there is less likelihood of dislodging the stone and pushing it upward. Once the ureter has been identified above the stone with the forefinger, it is freed by blunt dissection. At this point Garvey has modified the technic in that he frees the ureter by blunt dissection using a Kelly forceps under vision. It seems that this method decreases the chance of displacing the stone upward. Once the ureter is identified above the stone, it is important not to let it go until something has been passed around it or actually underneath it. Schroeder used blunt hooks to place around the ureter above and below the stone. We have found that a long Kelly forceps can be slid in the wound underneath the ureter and will serve well as a retractor, and at the same time stay out of the wound sufficiently to allow easy incision of the ureter.

In cases where the stone slips up the ureter in the process of freeing it, Bergman has made good use of the Johnson basket to engage the stone and remove it. He was successful in removing

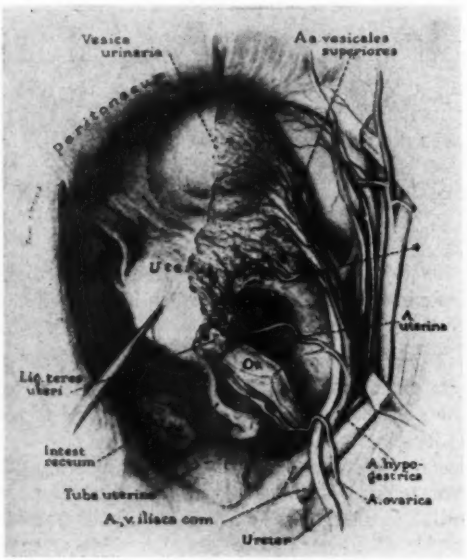

Fig. 1

Diagrammatic illustration of the relationship of the lower ureter to the surrounding structure. (By permission of *Surgery, Gynecology and Obstetrics.*)

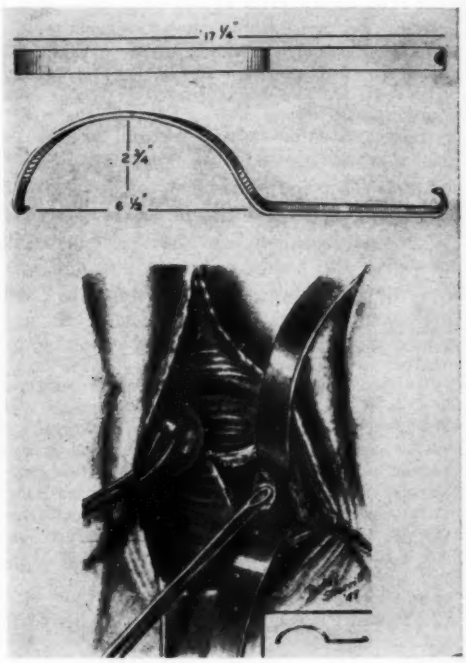

Fig. 2

Diagrammatic illustration of the incision through the vaginal wall, showing the ureter having been freed and delivered into the wound. Also illustration of Dr. Garvey's special retractors. (Courtesy Williams & Wilkins Company, Baltimore, Maryland.)

the stone three times in five such attempts. We have never used this but we probably should have. It seems likely that the loop catheter should also be useful in retrieving stones in cases where they slip out of reach.

The incision in the ureter when the stone has been removed, should be closed with interrupted fine plain catgut. The advisability of leaving a catheter in the ureter is somewhat debatable, evidence being in favor of the indwelling catheter, provided it can be placed without too much difficulty. The vaginal wound may be partially closed or left completely open. Where the stone has been recovered at operation, it is preferable to close it leaving a cigarette drain in the wound but being careful not to leave it in direct contact with the ureter. This drain should be removed within 24 to 48 hours. In our second case there was a considerable pooling of urine above the vaginal incision which necessitated the introduction of a bivalve speculum and opening the incision with a uterine dressing forceps and re-introducing a rubber dam drain.

These patients usually experience very little discomfort as a result of the operation and can readily be ambulatory on the second postoperative day.

COMPLICATIONS

Cobb, in 1940, reviewed the 80 cases then on record, finding four deaths. Only two of these deaths, however, can be directly attributed to the operation. One of these cases, that of Cobb, died of a general peritonitis caused by accidentally opening the peritoneum. The exact cause of the other deaths was not stated. Block reported a case attended by severe hemorrhage which required prolonged packing, and Bergman had trouble with bleeding in one of his cases. Both Shaw and Cobb reported opening the bladder in one case each; both cases made a complete recovery after repair of the injury. In two of our cases the bladder was opened.

Ureterovaginal fistula has not been encountered in our series and from the reports in the literature, is not a serious hazard. This complication probably occurs only when there is obstruction of the ureter below the ureterotomy.

Hemorrhage is one of the most frequent complications. However, so long as the uterine artery is not injured, hemorrhage is not serious and is easy to control. We have been able in most cases to locate any undue oozing and control it with figure-8 sutures of plain catgut. It should be remembered that the uterine artery is located above and medial to the ureter at the point at which one is working and for that reason Shaw's dictum of approaching it posteriorly and laterally should be followed.

CASE REPORTS

Case 1.—P. K. E., aged 65, white, para 4, was first seen on May 5, 1938, with a history of repeated attacks of urinary infection during the preceding two years, which required hospitalization on several occasions. As a result of laceration from childbirth, she had a markedly

Fig. 3, Case 1
Stones being delivered from the ureterotomy. The marked procidentia present permits the ureter to be delivered almost to the level of the entroidus.

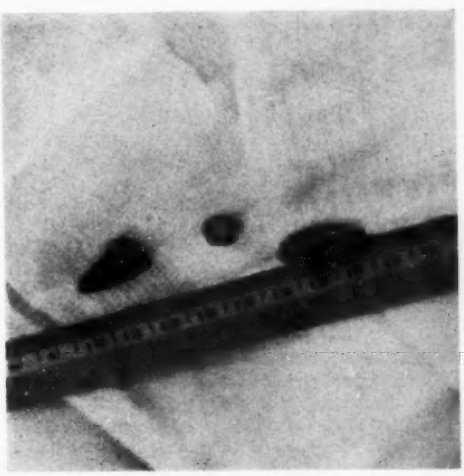

Fig. 4, Case 1
Stones removed.

relaxed perineum with a complete prolapse of the uterus and bladder.

Cystoscopy and retrograde pyelography resulted in a diagnosis of three stones situated in the extreme lower end of the right ureter which had resulted in a grade two dilatation of the ureter and prevented the catheter from passing to the pelvis on this side.

Palliative measures were tried during the next two months to no avail. On June 29, 1938, a vaginal ureterolithotomy was done under spinal anesthesia. The stones being firmly impacted in the ureter, no attempt was made to place an indwelling catheter. Gentle traction on the cervix brought the uterus and bladder so far out that we were working only a short distance within the vaginal orifice. An incision in this instance was made about two inches long, the center of which was carried completely through the vaginal wall, and then the incision was stretched to permit the introduction of two fingers. The stones were readily palpable and although the ureter was adherent, it was approached from above the stones, freed sufficiently to grasp the ureter with an Alice forceps above the stone. After removal of the three stones through an ureteral incision, a No. 6 catheter was then passed through the ureteral incision up to the pelvis of the kidney, after which the other end was passed retrograde down into the bladder and later pulled out with a cystoscope. The ureterotomy was closed with two or three small plain catgut sutures. The vaginal wound was closed beginning laterally with interrupted chromic 0, leaving a cigarette drain medially in the vaginal incision.

The patient made an uneventful recovery. The maximal temperature was 101° and she was up and about at the end of the first 24 hours, and allowed to leave the hospital on the seventh postoperative day. There was still a leakage of urine from the vagina on the twelfth postoperative day, when she was found to have 8 ounces of residual urine. An indwelling Pezzer catheter was left in the bladder for four days, after which there was no more urinary leakage. Subsequent follow-up on the patient over a period of several years revealed no stricture at the side of the stone.

Marked perineal relaxation and mobility of the uterus and bladder plus the fact that these stones were large and impacted, made the operation exceptionally easy in this case.

Case 6.—D. C. F., aged 28, white, married, nulliparous, was reported to have a nonopaque stone situated at 1 cm. in the left ureter with a 30 cc. stasis of urine and a pyelonephritis. Although the obstruction was passed on the first cystoscopy and an indwelling catheter drainage instituted for two days, on subsequent cystoscopy the obstruction at 1 cm. could not be passed. It was thought that a stone could be palpated in the left lower ureter.

On January 19, 1944, a vaginal ureterotomy was done under spinal anesthesia. Although this patient was nonparous, there was adequate room in the vagina to perform this operation. After making the usual vaginal incision, the ureter was readily picked up and freed with comparative ease, but no stone was identified. It was thought that this stone was in the intramural portion of the ureter, which is an exceptionally difficult location from which to identify or remove a stone. The intramural portion of the ureter was dilated by retrograde means through the ureteral incision until a small uterine probe could be passed. It was felt that the stone was pushed into the bladder. Since there was some doubt in our minds as to whether the stone had been dislodged into the bladder, the incision in the ureter and the vagina vault was left open. Cystoscopy was carried out immediately following this procedure and there were a few small blood clots in the bladder with what appeared to be some fragments of stone. A No. 6 catheter at this time passed readily up the ureter to the kidney.

The postoperative course was uneventful. She left the hospital on the fourth day. However urine continued to drain through the vagina and on the twenty-ninth postoperative day, the diagnosis of vesicovaginal fistula was definitely made, the opening being situated just medial to the left ureteral orifice. This fistula was closed three months postoperatively by a gynecologist. There was no recurrence of her kidney symptoms and the ureter was found to be patulous on the twelfth and twentieth postoperative days.

This case was not well selected. The stone was not visible on x-ray; consequently we could not be sure of its size and location. Injury to the bladder however, can be credited only to poor operative technic. It is difficult to estimate when the bladder was injured, but in all probability it occurred in the process of trying to pass the probe down the ureter. The injury must have been very slight because it was not recognized on cystoscopy immediately following the operation.

Case 10.—E. T. M., aged 49, white, para 1, was ad-

Fig. 5, Case 10
KUB, showing large lower right ureteral stone.

mitted to Hotel Dieu Hospital October 19, 1946, after cystoscopy, and x-ray revealed a long oval-shaped stone in the distal end of a markedly dilated right ureter.

Two days later a vaginal ureterotomy was done under spinal anesthesia. An obstruction at 1 cm. prevented the catheter from being passed up the ureter just prior to operation. The stone was readily palpated *per vaginam*. The usual incision was made. The ureter above the stone was identified and an attempt was made to free it. It was so densely adherent that freeing it was most difficult and the stone slipped up the ureter out of reach. We were never able to free the ureter sufficiently to deliver it into the wound. An incision 1 inch long was made in the ureter and both the ureteral and vaginal wounds were left open.

Fig. 6, Case 10
Shows marked improvement in dilatation of the ureter and kidney postoperatively.

Cystoscopy was done on the third postoperative day and a No. 5 catheter passed up the ureter with some difficulty. X-rays showed the stone to be in essentially its original location. On the following day, a second attempt was made to remove the stone by the vaginal route. The wound was already open, the ureter was identified, but the ureteral catheter which had been placed in the ureter the day before had worked down. In attempting to engage the ureter the stone was again pushed up.

Four days later the temperature spiked to 104° and on the following day, four No. 5 catheters were passed up the ureter and left in for two days. There was 40 cc. stasis at this time. On withdrawing the catheters, the stone was not engaged, but on the following morning the stone was passed *per vaginam*; recovery was rapid after this. Urinary drainage stopped about thirteen days after the second ureterotomy. The marked dilatation of the ureter and pelvis soon returned to normal.

The difficulties encountered in this case were due to the marked peri-ureteritis with adhesions, a markedly dilated ureter and our inability to

Fig. 7, Case 12
KUB, showing stone caught with loop catheter which served to fix stone, greatly facilitating the operation.

Fig. 8, Case 13
KUB shows location and size of the ureteral stone, fixed in the ureter with two catheters.

pass catheters by the stone to fix it. The stone basket or loop catheter should have been tried following each operation.

Case 13.—In contrast to the two previous cases is that of I. G. LaF., aged 28, white, para 6, who had spontaneously aborted a three-months fetus, six weeks prior to her first visit to me on November 19, 1940. She was found to have a medium-sized stone at 5 cm. on the right side with a hydro-ureter and pelvis, grade 3. On the following day she was hospitalized with temperature 106° and two No. 5 catheters were left in the right ureter.

After two days of indwelling catheter drainage, a vaginal ureterolithotomy was done under spinal anesthesia. The stone was readily palpable and the incision was made directly beneath the stone, for a distance of one inch and then enlarged by actually stretching the wound first with a Kelly forceps and then with two fingers. The ureter and stone were easily located and the ureter freed above the stone just sufficiently to pass a large Kelly forceps beneath the ureter above the stone. This permitted good vision and adequate room to incise the ureter over the stone. Two plain No. 00 catgut sutures were used to close the ureterotomy incision. A cigarette drain was placed in the vaginal wound and the vaginal wound closed with interrupted chromic catgut sutures, beginning on the lateral end of the incision, leaving the drain medially.

The indwelling catheters were left in postoperatively until the end of the second day, when the patient was allowed to go home. She leaked urine for one day after leaving the hospital.

This was an ideal case for vaginal ureterolithotomy because of the marked vaginal relaxation from her recent pregnancy and because the stone was fixed in the ureter by catheters.

SUMMARY OF RESULTS OBTAINED IN SERIES OF 13 CASES

All of this group of patients stood surgery very well, although in a few instances the procedure lasted for well over an hour. Moderate hyperperexia occurred during the first two to five postoperative days, as most cases had ureteral obstruction and pyelonephritis.

We failed to obtain the stone at operation in

Case	Name	Age	Date	Stone Obtained	Complications	Days of Urinary Drainage	Comment
1	P. E. So. B. H.	65	7 29 38	Yes, 3	None. Maximal temperature 101°	16	Marked procidentia simplified operation. Residual urine required indwelling urethral catheter before ureterotomy closure
2	S. G. B. So. B. H.	41	5 16 39	Yes	None. Maximal temperature 103°	8	Stone in one of the double left ureters; other ureter not injured
3	N. N. C. So. B. H.	50	9 15 41	Not at oper.	None. Maximal temperature 102°	11	Ureterotomy not closed; stone passed *per vaginam* following douche 1 week postoperatively
4	A. M. H. D.	38	11 13 42	Yes	None. Maximal temperature 102°	9	Recovery uneventful after indwelling ureteral catheter on fourth day. Pyelolithotomy same side tenth postoperative day. Subsequent nephrectomy opposite side
5	H. E. Z. H. D.	24	12 14 43	Yes	None. Maximal temperature 106°	10	Preoperative temperature 106°; recovery uneventful
6	V. C. F. So. B. H.	28	1 19 44	No. Stone apparently broken up and pushed into bladder	Vesicovaginal fistula	Drained until fistula was repaired, 3 months postoper.	Nonparous; no episiotomy done. Bladder opened, not recognized; required closure *per vaginam* 3 months later
7	C. J. R. H. D.	47	3 7 45	Yes	Bladder inadvertently opened, but recognized and closed	Not stated	Recovery uneventful; no fistula
9	L. M. C. H.	46	9 23 46	Yes	None	5	Point operated on through paramedian incision for same stone 8 28 46 by another urologist; could not reach stone. Recovery from V. U. L. uneventful; left hospital on eighth day
10	E. T. M. H. D.	49	10 21 46 10 25 46	Not at oper.	Temperature 104° following second operation	13	Stone passed *per vaginam* eleventh postoperative day
11	E. R. B. So. B. H.	30	5 1 48	Not at oper.	None	?	Stone passed *per vaginam* but not recovered; x-ray revealed stone in vaginal wound. Final results perfect
12	E.C.Mc	46	5 29 48	Yes	None	6	Operation made easy by engaging stone with loop catheter
13	I. G. LaF.	28	11 22 49	Yes	None	3	Six weeks postabortion 3 months fetus, facilitated operation; left hospital second postoperative day

Table 1

four cases. In one of these cases the stone was apparently broken up and forced into the bladder as the ureter was patulous immediately postoperatively. Of the other three cases in which the stone was not removed at operation, one case was operated upon again four days later, without securing the stone. All three, however, passed their stones through the ureterotomy incision into the vagina in five to fourteen days.

There were two cases in which the bladder was inadvertently opened. In the first case, this complication was not recognized and a vesicovaginal fistula had to be repaired three months later. In the second case the opening of the bladder was recognized, and closed with purse-string sutures of chromic catgut with no untoward effect.

No persistent ureteral fistulae were encountered. The longest period of urinary drainage through the vagina was sixteen days and the shortest was three days. In the former there was a residual urine of eight ounces, from marked prolapse of the uterus and bladder. An indwelling urethral catheter was finally employed. No case of ureteral stricture at the site of the stone or ureterotomy has been noted.

In our second case, the stone was removed from a double left ureter without any added difficulty. Our ninth case had been subjected to a three-hour attempted ureterolithotomy through a paramedian incision, by another urologic surgeon, one month prior to her vaginal ureterolithotomy. The operating time for the latter was less than thirty minutes.

In *Case 6*, a nulliparous patient, no especial difficulty was encountered in performing the operation. Although this was the case in which we had a vesicovaginal fistula, this complication could not be attributed to inadequate room in the vagina.

CONCLUSIONS

In properly selected cases, the vaginal approach is a valuable addition to our armentarium in removing lower ureteral stones. The factors facilitating removal of stones by this route are:

(1) Adequate vaginal room.

(2) Stones situated within the lower 5-6 cm. of the ureter and firmly impacted or fixed by one or more ureteral catheters.

The operation can be very easy and short, or difficult and prolonged. An occasional failure to get the stone at the time of operation should not discourage the use of this procedure. In most cases where the stone slips out of reach, it will pass *per vaginam* within a few days if the incisions are left open.

Serious complications should not occur when the surgeon has become sufficiently familiar with the structures encountered and has perfected the technic described by our preceptors.

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HODGKIN'S DISEASE COMPLICATED BY PREGNANCY*

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In 1947 a woman with Hodgkin's disease, whom we had been following in the Tumor Clinic of the Vanderbilt University Hospital, became pregnant. The question arose as to whether or not the pregnancy should be interrupted. In order to answer this question it was thought necessary to know: (1) the effect of pregnancy upon Hodgkin's disease and (2) the possibility of the infant's being normal. There will be presented the result of our review of the literature upon the subject of pregnancy complicating Hodgkin's disease and the outcome of pregnancy in the aforementioned patient and in another similar patient whom we observed subsequently.

The data compiled from a review of the literature, which we believe is complete,[1-38] are shown in *Tables 1-6*. (Our patients are not included in the tables.) This study revealed reports of 67 women with Hodgkin's disease which had been complicated by pregnancy. The statement that the diagnosis was made by microscopic section was made in the reports of only 27 of these patients.[1 4 7 8 10 11 14 16 18 19 22 23 25 26 27 28 29 30 32 34 38]

Table 2 indicates that there was progression of the disease during pregnancy in at least one-half of

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the women. Therefore, one cannot state that pregnancy does not exert a harmful effect upon women with Hodgkin's disease. However, it is likely that in at least one-half of individuals with Hodgkin's disease there would be progression of the disease over a period of nine months even though the disease were not complicated by pregnancy. Nathanson and Welch[24] said that, in Hodgkin's disease, the median life expectancy is 30 months and that "25 per cent of the 184 patients were dead in 16 months." Goldman and Victor[13] said that the average duration of life in 319 patients with Hodgkin's disease was 23.8 months. In our review it was possible to determine the duration of the disease in only 15 of the 22 patients who died. In the 15 patients the average duration of the disease from the time of onset of the symptoms until death was 28.2 months.

Table 5 shows the outcome of the pregnancies. In the 76 instances in which the outcome was given, the mother died in 2, and in 7 the pregnancies were interrupted. Thus there were 7 spontaneous abortions (less than 11 per cent) in 67 otherwise uninterrupted pregnancies. This percentage is lower than the percentage (20) of spontaneous abortions which is normally expected.

Of 60 infants borne by mothers with Hodgkin's disease only one was found to have the disease. Priesel and Winkelbauer[32] in 1926 reported this patient. The mother was thought to have Hodgkin's disease but the microscopic findings in a section of tissue removed from the abdominal wall were somewhat equivocal. The infant became ill soon after birth and died at the age of four months. Postmortem examination revealed typical widespread Hodgkin's disease, including lesions in the subcutaneous tissue, liver and bone. The photomicrographs in the report of the infant lead one to believe that the diagnosis was correct.

Table 6 reveals that the follow-up studies on 24 infants were not recorded but that at least 16 (28

Number of Women	Number of Pregnancies Per Patient	Total Number of Pregnancies
*53	1	53
11	2	22
2	3	6
1	4	4
67		*85

*In 11 of these women the number of pregnancies was not stated. Therefore, we assume that there was only one pregnancy.

Table 1†

†(1, 2, 4-19, 21-23, 25-32, 34, 36-38)

EFFECT ON MOTHER DURING PREGNANCY

No Progression of Disease	Progression of Disease	Not Stated	Total Number of Patients
15	34*	18	67

*Two of these patients died of Hodgkin's disease before the infant was born.

Table 2

STATUS OF MOTHER

Died During Pregnancy	Died Later	Status Not Recorded	Living When Article Was Written
2	20	25	20

Table 3

DURATION OF LIFE AFTER PREGNANCY OF WOMEN WHO DIED (YEARS)

Less than 2	15
2½	1
3	1
3½	1
5	1
9	1
Total	20

Table 4

OUTCOME OF PREGNANCY

Infants		Mother	Abortions			
Normal	Abnormal	Died	Spontaneous	Therapeutic	Not Stated	Total No. of Pregnancies
59	1	2	7	7	9*	85

*Three were pregnant and had not been delivered at the time the article was written.

Table 5

FOLLOW-UP STUDIES ON INFANTS

Alive and Well: Number of Infants	Period Followed (Months)
4	0-5
2	6-11
6	12-23
5	24-35
16	35+
Total 33	
Died* 2	Not followed 24

*One 7 months infant died 4 days after birth. Death was from prematurity. There was no evidence of Hodgkin's disease in the infant or placenta. One child died following an accident at the age of 3 years.

Table 6

per cent) of the 59 infants were alive and without evidence of Hodgkin's disease three or more years after birth. Not one of the 59 infants was said to have developed Hodgkin's disease.

It was thought by Gilbert[12] and Goldman and Victor[13] that roentgen ray therapy was as effective in pregnant women as in individuals who were not pregnant. They found that this therapy caused no untoward effect upon the course of the pregnancy or upon the fetus if the irradiation were not administered directly to the pelvic area.

COMMENT

We believe that our studies show that although there may be progression of Hodgkin's disease during pregnancy, there is no evidence to show that pregnancy itself has deleterious effects upon the disease. Furthermore, there is an excellent chance that the infant will be normal. In view of these two facts we believe that there should be no therapeutic interruption of pregnancy in a woman with Hodgkin's disease.

CASE REPORTS

Case 1 (History 159080, Surgical Pathology 21553).—This patient was a married white woman, 32 years of age, who was first seen on March 21, 1947, in the Out-Patient Department of the Vanderbilt University Hospital complaining of swelling of the left side of the neck of 2 years' duration. Six weeks before admission to our clinic she had noted a mass in the left axilla which had rapidly increased in size. The woman had had two normal children and no other pregnancies.

There were about 15 enlarged, firm, nontender lymph nodes in the anterior and posterior triangles of the left side of the neck and in the left supraclavicular region. In the left axillary region there was a firm lymph node present which was about 6 cm. in diameter. Her weight was 125 pounds.

The erythrocyte count was 4.18 million, hemoglobin 13.5 grams, leukocyte count 11,850 and the differential count was normal.

On March 25, 1947, one of the cervical lymph nodes was excised. The microscopic sections (*Fig. 1*) showed that the normal architecture of the node had been disrupted. There was extensive fibrosis and there were present numerous eosinophils and Sternberg-Reed cells. The diagnosis was Hodgkin's disease.

On May 8, 1947 several small lymph nodes were palpable in the right side of the neck and the right axilla. On September 11, 1947 it was noted that her weight had decreased from 125 to 117 pounds over a period of 6 months. At this time she complained of pain in the left shoulder and examination revealed further enlargement of the left cervical and axillary nodes. From September 11, 1947, to September 30, 1947, a total of 1900 r. was administered to the left cervical area and an identical amount to the left axilla. Following the completion of the roentgen ray therapy the only nodes palpable were one in the left supraclavicular region and one in the left axilla.

On November 20, 1947, she said that her last menstrual period had been on September 6, 1947. Examination revealed the signs of pregnancy. Ten days before delivery the left supraclavicular node had disappeared, the left axillary node was unchanged and in the right axilla three soft nodes about 0.5 cm. in diameter were present. The pregnancy was entirely uneventful. On June 13, 1948, she was delivered *per vaginam* of a normal female infant who weighed eight pounds, eleven ounces. The baby was not permitted to nurse the mother's breast. The postpartum course was uneventful except for an abscess at the base of the first molar tooth which subsided after incision and drainage.

On July 29, 1948, there were palpable a few small nodes in the left cervical region, a 3 cm. left axillary node and a 1 cm. node over the sixth rib just lateral to the left breast. On December 9, 1948, the left axillary node was unchanged and the node over the sixth rib was 3 cm. in diameter and attached to the rib. On June 2, 1949, her weight was 125 pounds and the physical findings were unchanged except that the left axillary node was 5 cm. in diameter. On August 9, 1950, her weight was 118 pounds and the physical findings were unchanged except that there was a right axillary node and a right supraclavicular node, each 5 cm. in diameter. The baby was over two years old, perfectly healthy and weighed 28 pounds.

In this patient there was no progression of the Hodgkin's disease during pregnancy or one year later, and very little progression two years after the birth of the baby.

Case 2 (History 168829, Surgical Pathology 23479).—The patient was a married white woman, twenty-two years of age, admitted to the Vanderbilt University Hospital April 19, 1948, complaining of enlargement of lymph nodes in the neck, of two months' duration. The enlargement was bilateral but was more pronounced on the right. Six weeks before admission bilateral axillary node enlargement had been noted.

There was a familial history of tuberculosis (mother, brother, sister). The patient was said to have had pulmonary tuberculosis in 1934, the roentgenologic evidence of

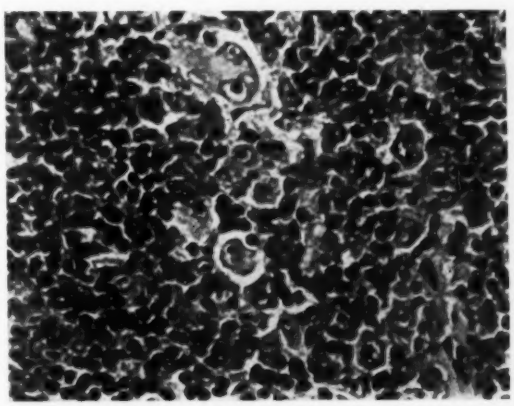

Fig. 1

Case 1.—Surgical Pathology 21553. Typical Sternberg-Reed cells are shown.

which had disappeared in 1937. She had a normal full term delivery in May 1947.

In the right supraclavicular fossa there was a firm, nontender, movable node 4 x 4 centimeters in size with a similar smaller mass inferior to it. Two smaller nodes were felt in the left supraclavicular fossa. In both axillae there were several nodes, none of which was larger than 1 cm. in diameter. Her weight was 84½ pounds.

The chest film showed widening of the mediastinum which was most striking on the right. The widening was thought to be due to the presence of lymph nodes. There was no evidence of parenchymatous pulmonary disease except for slight calcification in both lungs.

Two right supraclavicular nodes were removed. The nodes, on cut section, were yellowish gray. The microscopic appearance was characteristic of Hodgkin's disease (*Fig. 2*).

The patient was given 1,700 r. to both sides of the base of the neck and the anterior mediastinum through four portals over a period of two weeks. At the end of the course of therapy, there were no palpable cervical nodes.

On October 12, 1948, her weight was 92½ pounds and no recurrence of the supraclavicular nodes was noted. Her status two months later was unchanged. Although she was advised to return to the clinic in one month, she did not return until January 13, 1950. In July, 1949, she had been delivered of a full term normal male infant. She felt fine during the pregnancy and until December, 1949, five months after the birth of the baby, at which time she noted that the cervical lymph nodes had reappeared and that she had begun to feel weak.

She was readmitted to the hospital on February 8, 1950. The right supraclavicular fossa contained nodes similar in size and number to those found on the first admission. Roentgenogram of the chest showed no widening of the mediastinum but revealed two cavities in the middle lobe of the right lung. Smear of the sputum showed acid-fast bacilli in large numbers. A total of 1,800 r. was given to the right supraclavicular area over a period of eight days with decrease in size of the nodes. She was discharged February 25, 1950.

In another institution a right phrenicotomy was done. In May, 1950, she noted a mass in the left portion of the abdomen.

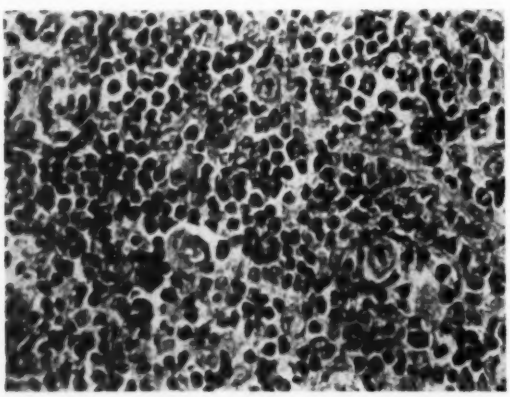

Fig. 2

Case 2.—Surgical Pathology 23479. Typical Sternberg-Reed cells are present.

She was admitted to the hospital for the third time on May 27, 1950, complaining of abdominal pain, nausea and vomiting of two weeks' duration. She weighed 79 pounds. Examination revealed shotty cervical nodes bilaterally, and similar left axillary nodes. A nodular, slightly tender spleen could be felt to descend to the pelvic brim. Roentgenogram of the chest showed that one cavity in the upper lobe of the right lung was much smaller and the other was not present. Gastro-intestinal series showed a filling defect 8 x 8 centimeters in size along the lesser curvature without mucosal deformity, and a similar defect in the pyloric region. It was thought that the findings were caused by Hodgkin's disease. Over a period of two weeks 3,400 r. were given to the mid-epigastric and left lumbo-dorsal area through two portals. On July 22, 1950, her weight was 73 pounds. She had had no more pain, nausea or vomiting. The spleen was barely palpable.

The second infant, born 16 months after the diagnosis of Hodgkin's disease had been made in the mother, had developed normally. At the age of 12 months the baby weighed 19 pounds and showed no evidence of Hodgkin's disease or tuberculosis.

This patient had no progression of the Hodgkin's disease during pregnancy and no symptoms of serious progression of the disease until nearly ten months after delivery.

SUMMARY

(1) The literature has been reviewed upon the subject of pregnancy complicating Hodgkin's disease.

(2) Two cases of Hodgkin's disease complicated by pregnancy have been reported.

CONCLUSION

If pregnancy occurs in a woman with Hodgkin's disease, the pregnancy should not be interrupted.

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CARCINOMA OF THE EXTRAHEPATIC BILE DUCT*

REVIEW OF RECENT LITERATURE AND A CASE REPORT

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This report is presented because of its rarity, and because the two commonest early symptoms of the disease, jaundice and weight loss, failed to appear until the late stages. Another unusual finding was the early febrile course secondary to subhepatic abscess.

The first authenticated case of carcinoma of the common bile duct was reported by Durand Fardel[1] in 1840. The first authenticated case of carcinoma of the common hepatic duct was reported in 1878 by Schuppel.[1] The total number of cases which have been definitely proven by biopsy or autopsy number far less than 300. Reports taken from the records of the Mayo Clinic probably constitute the greatest isolated group of patients with this disease.[1] During a period of 40 years from 1905 to 1946 they were able to collect 90 cases, all of which had microscopic or clinical proof of the site of origin of the tumor. Most of the other cases discussed in the literature were isolated cases taken from throughout this country and from British literature.

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INCIDENCE

Mayo Clinic reports over a ten-year period from 1937 to 1947, included 1,400 operations on the biliary tract. Out of this number there were 66 cases of malignancy of the extrahepatic duct or approximately one in every 210 operations. In this same series there were 44 cases of carcinoma of the ampulla of vater; 107 cases of carcinoma of the gallbladder; 521 cases of carcinoma of the head of the pancreas. This is the largest single group from which to collect statistics, but it agrees fairly well with smaller groups of cases, with the exception that most authorities have felt that carcinoma of the extrahepatic duct, excluding the ampulla of vater, was about one-fourth as common as carcinoma of the gallbladder.

Another statistical method in determining the frequency of carcinoma in the bile duct has been from autopsies in various medical centers. The Mayo Clinic reports in 12,000 consecutive autopsies, an incidence of 0.26 per cent. In other statistics it ranged as high as 0.45 per cent.

ETIOLOGY

The exact cause of the development of carcinoma in the extrahepatic duct is still unknown; however, several factors are thought to be important:

(1) Cases may develop from simple papillomas, as in carcinoma of the colon.[2]

(2) Trauma from calculi was previously thought to be a great contributing factor. Calculi within the gallbladder have been frequent where carcinoma of the gallbladder has been discovered. On the other hand, calculi in tumors of the extrahepatic ducts have been very few, and this cause has been minimized.

(3) Just as many feel that ulcers of the stomach frequently undergo malignant degeneration, it is felt that frequently ulcers within the extrahepatic duct undergo carcinomatous degeneration.

(4) The fourth factor now thought to be prevalent is the action of bile which contains compounds closely related to the carcinogenic agents. Repeated irritation with bile in a susceptible individual, is felt to be an important cause of carcinoma in this site. Cholic acid is chemically closely related to some of the proven carcinogenic agents.

Sex and Age.—In contrast to carcinoma of the gallbladder, which is definitely more common in females than in males, carcinoma of the extrahepatic duct is more common in the male. This ratio is quoted as about 50 males to 35 females.[3] The youngest patient in whom this condition has been reported was a female, age 23.[1] The commonest ages are between 50 and 70 years.

Symptoms. — The commonest symptom is jaundice, which is always present at one time or another during the course of the disease. The second commonest symptom is pain, which is present in 65 to 70 per cent. The third commonest symptom is weight loss, which has occurred in about 55 per cent of the patients when they are first seen by the physician. General weakness is a common finding, also generalized pruritis, and various digestive disturbances, usually with intolerance to fatty foods. As one would expect, there is an increased tendency toward hemorrhage; bile is usually present in the urine; some of the patients report typical biliary colic, chills and fever, but this is usually very late in the disease. Constipation is another symptom frequently given.[4] It is felt that the infrequency of chills and fever is due to the fact that the tumor is usually extremely small with little degeneration of its tissue, and also that presence of obstructing stones is infrequent.[1]

Clinical Findings and Laboratory Data.—As has been noted, the commonest finding is a definite clinical jaundice of the skin.[5] The presence of a palpable gallbladder depends upon the site of the new growth. It is usually palpable when the lesion is distal to the entrance to the cystic duct and usually not present when above this region. The pulse and temperature are usually normal; enlargement of the liver is more commonly detected than a palpable gallbladder, the former being present in about 70 per cent of the cases of the Mayo group.[1] About 50 per cent of the patients have tenderness on palpation in the region of the gallbladder. Laboratory findings are usually rather typical of obstructive jaundice, although at times evidence of hepatocellular damage makes differentiation difficult. Anemia is often found; there is some elevation in the white blood count; the nonprotein nitrogen is usually normal; prothrombin is usually low due to liver damage; cephalin flocculation is usually positive; a direct van den Burgh reaction is obtained if the patient is jaundiced; there are usually alcoholic stools and bile is usually present in the urine. On aspiration of the duodenum with Levine tube, one finds absence or only a trace of bile contents, and this is a very significant finding in many clinics in the preoperative diagnosis. The highest percentage of correct preoperative diagnoses in neoplastic lesions of the extrahepatic duct has been 20. In the Mayo Clinic it was reported that they were able to make only 8 per cent of diagrams preoperatively.[1] Even at the time of laparotomy when the lesion could be visualized, the diagnosis has been made in only 36 per cent of the cases. The commonest preoperative diagnosis in this lesion is carcinoma of the head of the pancreas, which presents very much the same clinical picture, and is much more common.

TREATMENT

The only form of treatment that offers any significant increase in the length of life is surgery. Up to this date no radioactive substances have proven beneficial. Nitrogen mustard has been of little or no value and x-ray and radium have caused little or no change in the majority of the lesions. Therefore surgery will be the only form of treatment discussed in any detail.

Surgery in carcinoma of the extrahepatic duct is always difficult and dangerous, but since the outcome is universally fatal without surgical intervention, we strive to perfect a technic that will alter an otherwise fatal prognosis. Marshall[6] said:

> "There is probably no position within the human body, outside the central nervous system, where a growth while yet small is heralded by more widespread symptoms and is attended by more uniformly disastrous consequences than carcinoma of the extrahepatic duct. Surgical treatment should have its favorable effect, since significant symptoms bring the patient to the physician early in the course of the disease when the tumor is small, slow growing and usually late to metastasize.

Obstructive jaundice is usually the cause of death before the tumor itself has passed the stage of operability."

In 1922, Renshaw[7] said:

"If it were not for hemorrhage, malignant conditions of the biliary duct, being as a rule small, limited within the walls of the bile duct and late to metastasize, would lend themselves readily to surgical treatment."

In spite of the recent great advances in the mechanism of control of bleeding associated with jaundice, the incidence of surgical cure has increased little if at all, making us realize that this is not the whole answer to the probelm. The incidence of metastasis even at the time of autopsy, has been reported to be rather low by most authorities. Dick[2] reported, that among 13 patients with carcinoma of the extrahepatic duct, 11 showed no extension beyond the wall of the bile duct at the time of autopsy. This remains one of our primary encouraging factors and one of the chief reasons for attempting surgical removal in a difficult location. Whipple and his associates[8] said that out of a total of 80 cases, 28 or 35 per cent died an operative death; 20 others or 24.6 per cent are known to have had recurrences; of the other 40 per cent it is probable that many died of carcinoma as only a very short follow-up was available. Brunschwig reports surgery in 12 cases[9] with only one living over one year, but this patient appears to be well. Many writers continue to say that in spite of recent surgical advancement, the prognosis is still universally fatal with or without surgery.

(1) One operative technic has been that of resection of the duodenum, the head of the pancreas, where the tumor is near the entrance of the common duct in the duodenum, with the hepatic duct being implanted into the stomach.[10] Dragsted has a very definite feeling that the pancreatic duct should be transplanted into the intestine in this case, as he, as well as others, have found that simple ligation of the pancreatic duct produces atrophy of the acinar tissue, while the islets remain normal. He feels that this results in a definite handicap in nutrition. Different patients seem to vary tremendously in the amount of pancreatic tissue which may be removed without the development of either diabetes or typical fat metabolism disturbance. It is the opinion of most of the observers that whenever possible, pancreatic secretion should be preserved by implantation of the pancreatic duct or ducts into the intestines.

(2) A second operative technic described where the lesion is low in the common duct, is that of resection and end-to-end anastomosis of the common duct. This was first done many years ago by Dr. Mayo.

(3) If the lesion is located in the common hepatic duct or the junction of the hepatic with the cystic and common duct, the procedure is as follows:

(a) First a resection with an end-to-end anastomosis may be performed.

(b) A resection with an anastomosis is over a vitalium tube.

(c) A resection with anastomosis with the remaining hepatic to the remaining cystic.

(d) Where the lesion is well down within the common hepatic duct so that the right and left hepatic communicate without obstruction, the procedure is that of a partial amputation of the left lobe of the liver and an anastomosis of one of the larger branches of the hepatic radical within the left lobe, with a loop of jejunum. This method has been described and performed probably more by Brunschwig.[11] He cautions that on occasions when one goes in and finds the point of obstruction to be at the head of the pancreas and a stone is not found, one should investigate further before going ahead with the Whipple procedure of excising the head of the pancreas. Occasionally one will find a very small common duct neoplasm, which can be removed locally, avoiding more radical surgery.

(4) Regardless of where the lesion is, when external drainage is carried out, as a form of treatment, this is universally only palliative and is very objectionable to the patient.

In discussing the surgical approach to lesions of the entrance to the hepatic duct, it is interesting to consider the results of ligation of the hepatic artery. In a case of carcinoma of the cystic duct, Brunschwig and Clark felt that they had a death on the twenty-second postoperative day in an otherwise completely successful operation, due to liver damage. The hepatic artery had been ligated during the surgical procedure. In a review of 10 cases in man, of known ligation of the hepatic artery, 6 died and 4 recovered. Of course there are cases where a ligation of all or a portion of the hepatic artery was done, without the knowledge of the surgeon, and the patient lived. In another review of 18 cases of ligation of the hepatic or branches of the hepatic artery, 7 died and 11 recovered. About 30 to 35 per cent of patients have anomalous branches of the hepatic artery, which help in survival after ligation of the main hepatic artery.

Pathologic Findings.—Three gross types of lesions are seen in carcinoma of the extrahepatic duct:[1] first is the villus growth, filling the lumen of the duct. The second type of lesion is nodular, appearing in the wall in the submucosal or intramuscular layers. It is very small and encircles the duct early and constricts. These are sometimes so small that they can be seen only under the microscope. The third type is a diffuse growth which converts the duct into a rigid tube. A small vegetation may project from the primary growth. Tumors of the bile duct are very rarely bulky and spread usually takes place by direct extension or by way of the lymphatics to the liver or down the duct to the pancreas. It is felt that in the past some carcinomas of the liver were extensions from a small primary in the bile duct that was never found. As has previously

been mentioned, most authorities believe that the lesions of the duct metastasize very late. Marshall[6] reported 49 cases: 12 of these had metastases at the time of surgery, 8 to the liver, and 4 to the regional nodes. Microscopically the picture is much the same as that seen in the gallbladder. In other words, almost all are adenocarcinomas, although some occasional squamous cell carcinomas have been reported. The case report which will be given in this paper contains both adeno and squamous cell types (*Figs. 1* and *2*). The lesion is commonest in the common duct according to all writers; second most frequently occurs at the junction of the cystic, hepatic common duct; third, in the hepatic duct, and least frequently of all in the cystic duct. Most writers, with the exception of those in the Mayo Clinic,[1] report a very small percentage of metastases at the time of surgery. In the Mayo Clinic 63 per cent of patients had metastases at the time of surgery, 14 per cent were without jaundice. But of this 14 per cent, 33 had already metastasized.

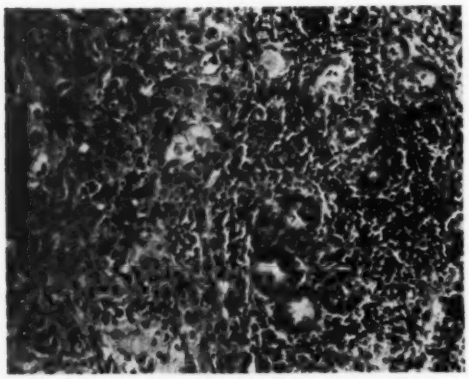

Fig. 1
Low power photomicrograph of tissue removed from extrahepatic bile duct.

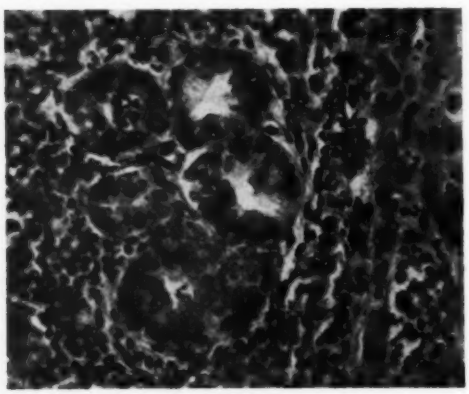

Fig. 2
High power photomicrograph of tissue removed from extrahepatic bile duct.

Theories of Jaundice. — Particularly in the villous lesion which is usually very bulky and the duct completely blocked, there is jaundice. There are other lesions which grossly permit sufficient patency of the duct to prevent complete obstructive jaundice, but have a partial obstruction. This occurs first, because of the lack of contractility of the duct, due to the invasive process, and second because of the lack of nerve impulses due to the invasion of the nerves themselves or lack of stimulus of bile flow.[1]

CASE REPORT

R. R. B., a 49-year-old white woman, was first seen in our office on September 2, 1949. At this time her chief complaint was of pain and soreness in the entire abdomen, and across her right hip and back, primarily on the right, some nausea but no vomiting, and rather marked nervousness. She also said that she had some pain down her right leg on attempting to raise the leg. She had been in excellent health until approximately one week before this visit, at which time she was on her vacation and had taken a 200-mile automobile trip. The first pain began the day after the automobile trip. It appeared in the upper right quadrant of the abdomen, extending down to the right lower portion of her right side and to the right costovertebral angle. At this time she had noticed no particular food intolerance, no jaundice, no change in the color of her stools, no weight loss, only the pain. Her past history was negative except for an occasional upper respiratory disease. She had had a tonsillectomy as a child, no other illnesses. Her family history revealed that her mother was living and in fair health at the age of 83; her father died at the age of 78 from unknown cause; she had one sister living and well; there was no history of cancer, tuberculosis, heart or kidney disease in her family. The patient was divorced from her husband and had one daughter living and well. She had passed the menopause seven years before at the age of 42, and had had estrogenic substance on only one or two occasions for excessive nervousness. System reviews were completely negative except as mentioned. She had nausea, vague indigestion, no vomiting and no previous food intolerance.

Physical examination at the time of her first visit revealed a well-developed and well-nourished white woman of about the stated age in no acute distress, but in a state of moderate discomfort. Physical examination was completely negative on her first visit except as confined to the abdomen, which revealed a moderate amount of tenderness in the right upper quadrant, but no muscular spasm or rigidity. The greatest point of tenderness was directly over the region of the gallbladder, which was not palpable. Rectal examination was completely negative, as was vaginal examination.

Although she gave no history of jaundice, change in the color of her stools or color of her urine, had never

had pruritus or intolerance to fatty foods, because of the tenderness over the region of the gallbladder, it was recommended that she have a gallbladder series. This was performed one week after her first visit to our office. The roentgenologist reported at this time that following priodax® there was no evidence of gall stones but an abnormal filling defect in the cystic duct and also a density of the gallbladder shadow, which could be evidence of limey bile salts. He recommended repetition of the gallbladder series. This was done as requested, three days later, September 12, 1949. At this time the report was of an abnormal density in the gallbladder and again the appearance, of what might be limey bile salts impregnating the submucosal lining of the gallbladder. The patient was very hesitant about having an operation, so she was placed on bile substitutes and given codein for her back pain. X-ray of her spine at this time revealed an old fracture at T-10 which could have been the cause of some of her discomfort in the costovertebral angle and right flank, as radiculitis. She was seen at frequent intervals and by September 20 some evidence of improvement in the tenderness of the region of the gallbladder was noted. On September 29, however, she was seen with an acute bronchitis and elevation of temperature. Because of this primarily, she was given intramuscular penicillin, which resulted not only in improvement of her bronchitis but in marked improvement in the pain in her right upper quadrant with immediate disappearance of her elevated temperature. Two weeks later, October 12, the pain in the right upper quadrant returned with greater severity. Because of the marked increase in the pain during the following few days, the patient came in on October 18 requesting surgery. She was admitted to the hospital the following day and routine laboratory procedures were done which revealed a negative urine, including test for bile. She also had a normal icterus index and no evidence of anemia.

On the following day under sodium pentothal® anesthesia a right upper rectus incision was performed, splitting the fibers of the right rectus muscle. The gallbladder walls were thickened but there was little or no distension of the gallbladder. There were adhesions around the region of the ampulla and the gallbladder appeared to contain a very dark type of bile. Following pressure the gallbladder emptied only with great difficulty. Palpation of the region of the entry to the common duct revealed evidence of induration. Further palpation revealed more marked induration extending up the course of the common hepatic duct entirely to the under surface of the liver. Because of the difficulty in emptying the gallbladder and evidence of the inflammatory process, it was felt that the gallbladder should be removed and the inflammatory area along the region of the common hepatic duct should be studied. It was only at this time that we felt that there was a possibility of malignancy of the hepatic duct. The gallbladder was removed, and it was decided to explore the common duct at the point of entrance into the cystic duct. In passing the probe upward toward the common hepatic duct, an abscess cavity was entered which contained approximately 60 cc. of thick creamy pus. Culture failed to grow any organisms from it. The abscess was thoroughly drained and a cigarette drain was placed in the cavity. It was felt that there might also be an abscess in the common hepatic duct and the probe could be passed only with great difficulty, so the opening was enlarged and a very friable piece of granulation tissue could be seen protruding from the common hepatic duct (*Fig. 3*). At this point we had a definite impression of carcinoma. A specimen was obtained by suction and forwarded to the pathologist. A frozen section was not requested however, as it was felt that nothing further could be done until the abscess cavity had been properly drained and infection cleared. The probe was passed downward into the common duct and after the friable tissue had been sucked from the common hepatic duct, the T-tube was placed to give adequate drainage. It was definitely decided that no radical surgery was in order at this time. We were somewhat surprised at the degree of obstruction by the friable tissue sucked from the hepatic duct, since the patient had had no evidence of jaundice prior to operation. The T-tube was connected to a bed side bottle, and there was only a moderate amount of blood-tinged bile drainage on the day following surgery. The patient's course was rather stormy, due to the leakage of pus and bile in the upper peritoneal cavity. An icterus test done on the fourth day following surgery was too weak to interpret. The abscess apparently gradually cleared and the drain was removed from the gallbladder bed on the eighth postoperative day. The patient's temperature had returned to a normal level. The drainage from the T-tube became more scanty and on the twelfth postoperative day, we suspected that the T-tube had been pulled out of the common hepatic duct as there was no drainage. There was no jaundice, the stools were well pigmented, and the urine showed no evidence of bile. A cholangiogram showed that the T-tube had slipped out of the common duct even though it had been sutured to the margin of the wound of the abdominal wall. Therefore the tube was removed. The patient had now lost approximately fifteen pounds in weight and continued to have some purulent drainage from the site of the T-tube.

At the time of initial surgery no nodes could be felt, no evidence of extension into the liver could be found and the region of the head of the pancreas was normal.

Because of the patient's condition and the complicating abscess, the trauma of a radical procedure to eradicate the tumor was not advised. It would have been technically impossible in the presence of the in-

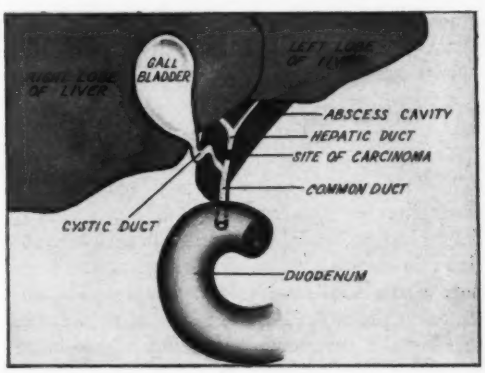

Fig. 3
Demonstrates the location of abscess cavity and site of carcinoma.

fection. Every supportive measure was used. Dr. Alexander Brunschwig of New York, with whom we communicated, advised against the radical procedure. He reported that in only one patient of 12, with a similar condition, life had been prolonged by the radical procedure. There were two possibilities of operation. Both the right and left hepatic ducts might be excised and the small intestine anastomosed to the porta hepatis; or the left lobe of the liver might be incised and the duodenum sutured to a large radical of the left hepatic duct.

On December 2 the patient was still free of jaundice. Four days later, however, clinical jaundice appeared. She had then been at home for approximately one week, where she was reasonably comfortable. She had to be dressed about every other day because of the continued purulent bile-stained drainage from the point of the T-tube insertion. When jaundice appeared, she began to lose strength and weight rapidly, and was readmitted to a local hospital. On December 15, 1949, she stopped draining bile from the T-tube site. Her stools lost their pigment and her icterus index increased. Approximately three days later there was a sudden appearance again of bile in her abdominal wound and this continued to drain rather profusely until her death. She was treated symptomatically, developing severe cachexia and having marked difficulty in obtaining bowel movements. She was kept on a fat free diet and bile substitutes, but her course was steadily downhill and she died on February 7, 1950. At autopsy a large tumor mass was found, approximately 8 cm. in diameter around the common hepatic duct, involving at this time by direct extension, almost half of the common duct, leaving only approximately 3 cm. of the common duct uninvolved and patent at the entrance into the duodenum. Both the right and left hepatic ducts were involved in the inflammatory neoplastic mass. In spite of the size of this mass however, there was no evidence of metastasis in the liver, lymph nodes or the head of the pancreas.

We feel that had it not been for the abscess formation, a radical procedure such as anastomosis of the small intestine to the porta hepatis or incision of the left lobe of the liver with an anastomosis to the large hepatic radical, might have benefited the patient greatly. However, as is usually true in the presence of malignancy and abscess formation, the malignancy became rather widely disseminated through the abscess cavity in a very short time.

SUMMARY

The three most common early symptoms of carcinoma of extrahepatic ducts are jaundice, weight loss and pain. Pain was a persistent complaint in our case probably because of the presence of the sterile subhepatic abscess. The abscess was probably due to erosion of the hepatic duct by the carcinoma producing bile leakage. With the improvement in the means of controlling hemorrhage in the presence of jaundice, and with the modern advancement in surgery, and because of the universally fatal outcome without surgery and the late metastasis in the larger per cent of cases, we are challenged to make greater efforts toward surgery in this condition.

Life expectancy of the patient following the appearance of the first symptoms ranges from a few weeks to a year. Carcinoma of the extrahepatic bile ducts can be expected in approximately 0.5 per cent of all operations upon the biliary tract. It is slightly more common in males than in females and the age of the greatest incidence is between 50 and 70 years.

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INDIRECT AIR CYSTOSCOPY*

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To every urologist difficult problems in cystoscopy present themselves and at times make the procedure unsatisfactory or impossible. Therefore, any new instruments, accessories, or technics enhance proportionately the diagnostic acumen of the operator.

The great majority of urologists use water as the visual medium in cystoscopy, this method being adaptable to both male and female pa-

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tients. However, some urologists prefer air cystoscopy for female patients and use this direct method solely in their practice if the work is limited to the female.

The respective merits and shortcomings of the two technics, the water (or indirect) and the air (or direct), are well appreciated by all urologists who are familiar with both. It is not, in the least sense, the object of this paper to compare in general the advantages and disadvantages of the two methods of cystoscopy. However, a method that is a composite of the two is worthy of consideration, not to replace either, but as an adjunct to both. This composite method is called indirect air cystoscopy.

The most universally used and oldest method is the indirect water method. In 1877, Max Nitze[1] of Berlin constructed the first practical optical water cystoscope, though there had been previous less successful attempts at endoscopy dating back to Bozzini of Frankfurt in 1806.[1] The Nitze instrument, although crude, had some power of magnification and used for illumination a brilliantly heated platinum wire. However, the principle has remained unchanged and with the introduction of newer technics and the addition of countless modifications of instruments and accessories, water cystoscopy has become the extremely accurate science it is today.

In 1893, Howard A. Kelly at the Johns Hopkins Hospital introduced a direct method, using air as the medium. This technic presented many advantages of simplicity and rapidity. It required less paraphernalia, and asepsis was more easily maintained. The cumbersome irrigating flask was eliminated. However, the use of the air cystoscope is limited to the female because only in the female is examination of the bladder feasible in the knee-chest position, and this position, or some modification thereof, is required to obtain negative atmospheric pressure in the bladder to permit distention.[1]

Nevertheless to practice female urology with highest competence the urologist should be familiar with the advantages and disadvantages of both methods. For instance, if direct topical application to the bladder mucosa is desired one would choose the direct technic, whereas if some contraindication to the patient's being put in knee-chest position exists one would choose the water technic with the patient in the dorsolithotomy position.

Indirect air cystoscopy utilizes certain principles and technics of both the air and the water methods, combining these in a manner to eliminate some of the shortcomings of each and retain certain advantages of both. The woman is placed in the knee-chest or knee-elbow position, the cystoscope inserted and the bladder allowed to inflate with air by virtue of the negative pressure created intra-abdominally in this position. The indirect or water type of cystoscope is now used for inspection and treatment of the urinary tract (*Fig. 1*). Minute inspection of the bladder by the indirect cystoscope is now performed using

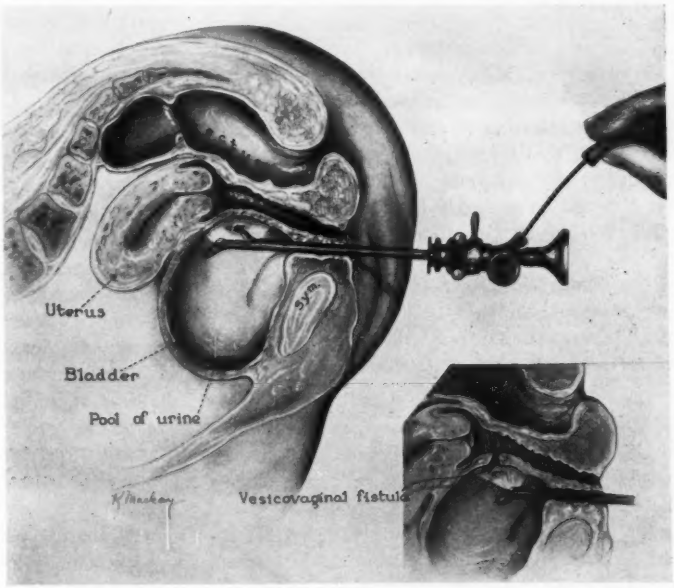

Fig. 1

Sagittal section of woman in knee-chest position, showing bladder distended with air and indirect type of cystoscope in place. Tip of ureteral catheter is engaged in right ureteral orifice. Note rubber sleeve protecting catheter from contamination by operator's hand.

Fig. 1 (inset)

Showing case of vesicovaginal fistula. The bladder is adequately expanded. A most satisfactory close-up examination of the affected area is feasible with the indirect cystoscope using air as the visual medium.

air instead of water as the medium. The advantages and limitations of this indirect or composite type of air cystoscopy will be discussed more fully.

Apparatus. — Instruments for both air and water methods should be available, but their respective number may be minimal, or may be in keeping with whatever procedure is contemplated by the urologist. Since the great majority of practicing urologists have at their disposal various types of water cystoscopy instruments and accessories for upper urinary tract study, they would require very few additional instruments. But for gynecologists who practice solely air cystoscopy it would be necessary to acquire some type of indirect cystoscope complete with sheath and the various types of telescopes.

It has been found that because of the ease of manipulation of the various telescopes and catheters with the patient in knee-chest position the Brown-Buerger, or some modification thereof such as Young's cystoscope, is most satisfactory. The No. 24 French convex sheath has proved most satisfactory for several reasons. This size may be passed into practically all female urethras without the preparatory dilation which predisposes to bladder spasm and lack of cooperation on the part of the patient. In addition, this sized sheath will accommodate two No. 7 French ureteral catheters simultaneously if bilateral ureteral catheterization is desired. Some urologists may prefer the larger sheath for larger catheters or larger telescopes giving a wider field of vision, but it would be necessary to dilate the urethra to a No. 30 French Hegar dilator to accommodate the larger sheath. This slight difference of size of the dilators usually necessitates using a local or general anesthesia, whereas the No. 24 French sheath used with adequate lubrication and careful manipulation does not require an anesthetic.

Technic.—If simple inspection of the bladder is to be done no preoperative preparation is needed. However, if the procedure is to be prolonged it is advisable, generally speaking, to give the patient a sedative, not to induce sleep but to allay apprehension and minimize the discomfort of manipulation and treatment. If indirect air cystoscopy is to be done in the office the following technic may be used:

The patient is first placed on the office examining table in dorsolithotomy position and catheterized, obtaining at this time a specimen for culture and routine chemical and microscopic examination. The bladder is emptied and catheter removed. It is advisable at this time to perform a thorough gynecologic examination to find any extrinsic bladder disease which may be contributing to the complaint. This preliminary examination is most important but should be done gently so as to cause least trauma to the bladder and also to maintain the patient's fullest cooperation. After appraisal of the pelvis by the combined recto-vagino-abdominal examination, the patient is turned to the knee-chest position. After the bladder is distended and cystoscope in place the patient may assume the more comfortable and less tiring knee-elbow position.

The labia are spread allowing the vagina to balloon out, then the external urethral meatus is carefully treated again with antiseptics and the Young's cystoscope with obturator is very gently inserted as far as it will go. This being the greatest depth of insertion, the danger of carrying organisms into the urethra and bladder is minimized as the labia are released. The cystoscope is rotated and gradually withdrawn in course of examination.

Complete inspection of the bladder can now be accomplished by gentle manipulation of the sheath and by using any or all of the inspection telescopes at hand. The patient feels no discomfort, and asepsis is maintained.

After thorough inspection of the bladder, including the trigone and ureteral orifices, a differential appraisal of the kidneys' function may be easily performed in the same operation. Five cc. of indigo carmine are given intravenously (dorsal vein of the hand is convenient) by an assistant and, though there are known limitations of indigo carmine as a kidney function test, this provides a simple office appraisal which may indicate further and more complete study or which may prove entirely sufficient. After noting the time of injection, the appearance time of the dye in the ureteral streams is determined. It is frequently possible using indirect air cystoscopy to visualize both ureteral orifices simultaneously. The comparative rate of secretion and concentration of the dye is also noted.

After completion of this simple but thorough bladder inspection the patient is allowed to get up, having been subjected to no more discomfort than catheterization of the bladder. Further conditions that may be encountered will be discussed later.

In the event that a further urologic work-up

is desired, including retrograde pyelography and more thorough differential kidney study, the patient is better prepared for a more prolonged procedure. A preparatory injection of a small dose of morphine (grains 1/8) may be given as usual preoperative routine. Some urologists rely entirely on a moderate dose of barbiturate, not enough to induce sleep but to allay apprehension and raise the threshold of pain.

Preparation of the vulva and perineum is done as for air cystoscopy.[2] The bladder is allowed to inflate as the obturator is withdrawn and the bladder is inspected with the indirect cystoscope. If there should be found an area suggesting topical application or biopsy under direct vision a Kelly air cystoscope may be inserted for this procedure. However, if this is not indicated and the Young's cystoscope is still in place, the ureters may be catheterized and upper urinary tract work-up completed. With the operating telescope in place it will be found unnecessary to employ nipples on the catheter guides unless the patient is too apprehensive to refrain from bearing down, or positive intravesical pressure is desired.

Complete asepsis may be maintained by using the same technic of handling the ureteral catheters as is used in air cystoscopy. After the tip of the catheter has been carefully passed into the operating telescope, the free end of the catheter is held over the patient's back away from the operator's head as he threads the catheter into the ureter. By employing small sections of rubber tubing slipped over the catheters, such as are used in air cystoscopy, the operator is able to manipulate without contaminating the catheters (*Fig. 2*). The stylets may be withdrawn by the assistant, when the operator desires.

When the desired procedures are completed the patient is returned to the table in the position suitable for collection of kidney urine specimens for differential tests or for injection of contrast media for retrograde pyeloureterograms.

DISCUSSION

By using indirect air cystoscopy the urologist is able to perform a complete bladder inspection and gross tests for differential kidney function as a simple office procedure. It may be done with the same ease and with no more discomfort than a routine bladder catheterization. By using this procedure in the office, one is able to rule out the lesions, the diagnosis of which would otherwise require much more time, technical difficulty and expense to the patient. Such conditions as interstitial cystitis, suspected bladder calculus, or a functionless kidney, may be found or ruled out.

If the No. 24 French sheath is used it is rarely necessary to use even a local anesthetic at the external urethral meatus because, as stated previously, the female urethra in the great majority of cases will accept even the No. 27 French instrument without discomfort to the patient. In

Fig. 2
Close-up showing detail of insertion of catheter into guide, and manner of manipulating catheter with rubber sleeve.

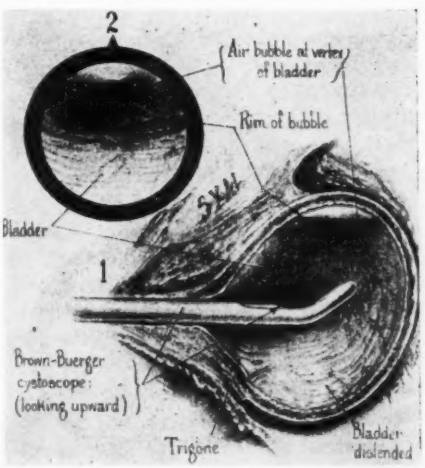

Fig. 3
Showing air bubble in dome of bladder with patient in dorsolithotomy position, using water as visual medium (Courtesy of American Cystoscope Makers, Inc.).

those cases where the bladder capacity is small and dilation is painful as in cases of Hunner's ulcer, the bladder is allowed to dilate very slowly by letting in small amounts of air through a small glass catheter with a tip of rubber tubing partially occluded. In this way the organ is not allowed to dilate suddenly and painfully. In other cases the lubricated sheath with obturator in place is inserted, and as the obturator is withdrawn the bladder is allowed to dilate fully immediately.

At first the urologist who has been trained solely with the water technic with the patient in the dorsolithotomy position may find himself slightly disoriented by the reversed position of the patient. However, this gives no lasting difficulty.

Air as the medium gives a less distorted and a clearer view of the bladder mucosa. By using indirect air cystoscopy one hundred per cent of the bladder mucosa may be visualized without difficulty. In using water as medium, one finds that the ever present air bubble in the bladder fundus causes distortion and otherwise unsatisfactory visualization of the mucosa above the surface of the water (*Fig. 3*). It may be quite troublesome to remove this bubble or to place the patient so that the bubble will shift into location. It is impossible to visualize the entire bladder with the direct air cystoscope, consequently lesions in the retropubic area of the bladder or immediately adjacent to the bladder neck may be missed (*Fig. 4*).

By using the indirect type of cystoscope with air as medium the entire bladder mucosa is very satisfactorily visualized. There may be a small dependent pool of urine but it will be found that the mucosa beneath is visible without distortion as the light passes from the air to water medium. If this pool should be cloudy or blood tinged it may be removed by aspiration or by allowing the patient to void again.

The topography of the bladder is slightly altered. The overlying cervix and fundus uteri make the trigone appear more prominent. The "horns" of the bladder are accentuated giving more prominent recesses laterally and superiorly than are seen in the dorsolithotomy position.

As the bladder is distended passively with air, a more normal appearance of the mucosa is seen. If it is distended with water there is a progressive blanching of the superficial capillaries by hydrostatic pressure as the intravesicular pressure is increased. In those cases where slight changes

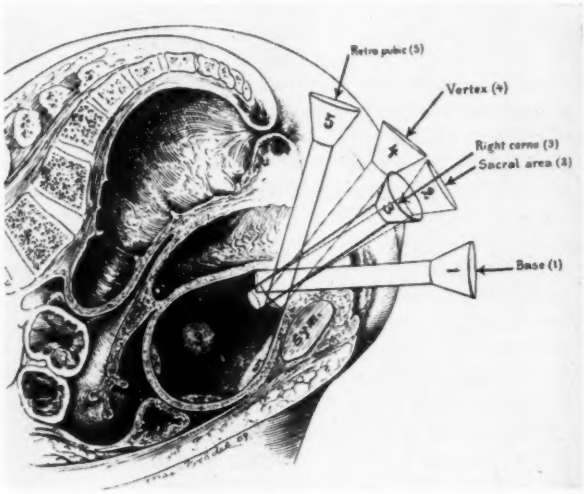

Fig. 4

Showing Kelly air cystoscope in various positions for inspecting the bladder. The retropubic area and that area immediately at vesicle neck are usually impossible to view satisfactorily. The trigone (vesicovaginal fistula) is viewed at an unsatisfactory flat angle. (From Kelly and Burnam: Diseases of Kidneys, Ureters and Bladder. New York: D. Appleton & Company, 1922.)

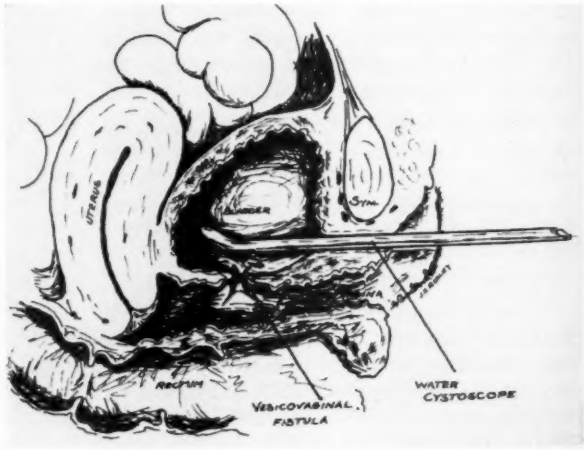

Fig. 5

Patient in dorsolithotomy position. Arrows indicate reflux of water into vagina via vesicovaginal fistula.

in mucosal vascularity are sought, these changes are more readily detected using air as medium and passive distention of the bladder. It has been noted that the slightly increased vascularity about the periphery of a Hunner's ulcer is more marked and more easily detected using indirect air cystoscopy than when using water as medium.

If there is a small amount of hemorrhage either from a mucosal defect or neoplasm the site of bleeding is quickly seen as the blood flows downward from this point. The operator is not troubled by clouding of the medium, or floating clots.

Because of the rapidity and ease of ureteral catheterization by indirect air cystoscopy, this method is useful in preoperative insertion of catheters when extensive pelvic surgery is contemplated. This preliminary procedure may be done in the anesthesia room prior to induction. This eliminates transporting the patient to the cystoscopic room where this simple procedure may consume more time and involve much more equipment and manipulation.

If done in the anesthesia room no extra equipment is needed other than that for catheterization of the bladder, and the water type cystoscope with ureteral catheters of desired size. No additional sterile set-up is required. Even though air cystoscopy is used in such circumstances and with very little more difficulty, there are relatively few gynecologic surgeons familiar enough with the procedure to perform ureteral catheterization as quickly as desired. Indirect air cystoscopy may be done by anyone familiar with either method and at the same time it eliminates the more extensive procedure of water cystoscopy. The patient is not removed from the operating table and is ready for immediate induction.

Asepsis may be rigidly observed in indirect air cystoscopy. As in the direct air method, the instruments that pass into the bladder and ureters need never be touched by the operator or assistant. Preliminary preparation of the vulva and introitus will minimize the chance for contamination, but careful sterilization of the external meatus and retraction of the labia as the instrument is inserted further eliminate danger of contamination. Careful and minimal manipulation of the sheath and withdrawal without reinsertion if possible maintain asepsis. The ureteral catheters are threaded into the guides of the operating telescope by holding the catheters with sleeves of rubber tubing (*Fig. 2*) like those used in direct air cystoscopy. The guides need not be touched by the operator at any time. The catheters are further slipped into the ureteral orifices, still using the rubber sleeves to prevent contact with the operator's hands. Asepsis is thus easily maintained, whereas in cystoscopy by water technic this is much more difficult, and at times so unsatisfactory that we must depend on antisepsis rather than asepsis for prevention of the introduction of pathogens into the urinary tract.

Indirect air cystoscopy is particularly valuable in inspection of the bladder in cases of vesicovaginal fistulae. It is highly desirable and sometimes absolutely necessary to appraise the condition of the bladder mucosa in the region of the vesicle ostium of the fistula and, most important, to determine the proximity of the ureteral orifices to the margin of the defect which frequently involves the trigone. If the exact relationship of the ureteral orifices to the fistula can be accurately determined the plan of operative attack can be much more individualized.[3]

A satisfactory view of a bladder with a vesicovaginal fistula may be very difficult to obtain using either direct air cystoscopy or water cystoscopy. If the defect is more than pin point in size and inspection is attempted by water cystoscopy, it is frequently found that while the patient is in dorsolithotomy position distention of the bladder is impossible as the reflux of water into the vagina is as fast as instillation into the bladder (*Fig. 5*).

In using the direct air method a good view of the vesical ostium of the fistula is frequently difficult because of the flat angle that the Kelly cystoscope makes with the bladder trigone. As there is usually present a varying degree of distortion of the trigone with displacement of the ureteral orifices, orientation may be difficult. Likewise, perception of the interrelationship of the orifices with the fistula may be impossible. In addition it has been found that manipulation of the examining instrument must be kept at a minimum because frequently the vagina, the base of the bladder and the vulva are extremely sensitive due to maceration, induration and deposits of urinary salts.

With indirect air cystoscopy, with the patient in the knee-chest position, the fistula may be more easily and more completely examined (*Fig. 1, inset*). The bladder will distend adequately

even though there has been some decreased bladder capacity by the complete incontinence. Adequate exposure of the fistulous opening in the vagina is obtained by using a Sims speculum. As the illuminated sheath of the Young's cystoscope is passed slowly through the urethra and into the bladder a great deal can be learned of the condition of the overlying tissues by transillumination. There may be thickening by induration, thinning by scarring, or normal tissue at the fistula margin. Occasionally the light may actually shine through the defect. Not only can the position of the ureteral orifices be seen, but the actual size of the fistula can be determined. If upper urinary tract investigation is indicated at this time ureteral catheters may be passed without difficulty.

Because there is no forced distention of the bladder and very little manipulation of the indirect cystoscope, the woman experiences little discomfort by this procedure even though the bladder may be irritable.

Satisfactory biopsy of the bladder may be done using indirect air cystoscopy. This has been done by using either the flexible shaft biopsy clamp with the Young's cystoscope or by using the Lowsley grasping forceps with a McCarthy foroblique telescope. Unless the area to be biopsied is in the dependent part of the bladder where a small amount of urine may be present the operator is not worried by clouding of the distending medium if bleeding occurs. Light fulguration of small bleeding points is done without difficulty. However, if a more extensive procedure is contemplated it is best done with the patient in the dorsolithotomy position.

One of the chief limitations of indirect air cystoscopy is that it is feasible only in the female.

As in direct air cystoscopy, the success of the procedure depends on the creation of negative intra-abdominal and intravesical pressure. This is best done in the knee-chest position but may also be accomplished in a less satisfactory manner in the Sims' position. If these positions cannot be assumed for some physical reason the operator may rely on the dorsolithotomy position with water as the distending medium.

In the event that the operator using indirect air cystoscopy desires further distention of the bladder than that which is present by virtue of the knee-chest position, he may actively distend the bladder further by pumping air into the bladder by means of a bulb such as that used with a sphygmomanometer. While using the inspection telescope the operator may distend the bladder as much as desired. However, if the operating telescope is used, intravesical pressure may be maintained by use of snugly fitting airtight nipples over the catheter guides. A little more difficulty may be encountered as the tips of the catheters are threaded into the holes of the nipples, but they can easily be started by using a sterile pair of forceps. After insertion is accomplished further advancement of the catheters is done by means of the rubber sleeves mentioned previously. It has been found that it is rarely necessary to employ positive intravesical pressure in indirect air cystoscopy. The amount of distention obtained simply by the knee-chest position is adequate for satisfactory inspection and for practically any procedure that may be performed with this technic.

When the patient is very obese, the operator may find it difficult to work with the direct air speculum. Because of the thickness of the buttocks there must be used an extra length Kelly cystoscope which makes visualization more limited, and manipulation more difficult. Similarly, the water cystoscopist may find his available working space much encroached upon by the obese legs. However, access to the external urethral meatus of the female is more easily attainable with the patient in the knee-chest position. Indirect air cystoscopy takes advantage of the knee-chest position with air as the medium, and also the greater length of the indirect cystoscope.

SUMMARY

Indirect air cystoscopy has been suggested as an adjunct to the armamentarium of female urology. It has been found that certain desirable features of both the water (or indirect) method and the air (or direct) method may be taken advantage of, and at the same time many of the shortcomings of each may be eliminated.

By using the indirect cystoscope with its assortment of telescopes and accessories, and air as medium, a closer and more minute inspection of the entire bladder may be obtained.

By using the knee-chest position, and air as the visual medium, a great amount of cumbersome equipment, such as the irrigating flask and tubes, and special tables, is eliminated. When the bladder is distended passively with air, a more accurate picture of the mucosal vascularity

is obtained than when the bladder is actively distended with water and a varying amount of blanching results from the hydrostatic pressure.

Complete asepsis is more easily maintained with indirect air cystoscopy than with the indirect technic of water cystoscopy. Such precautions as scrubbing the hands or wearing sterile gloves are not necessary in indirect air cystoscopy. It is consequently less time consuming.

For bladder inspection in cases of suspected interstitial cystitis (Hunner's ulcer), indirect air cystoscopy is most satisfactory.

Indirect air cystoscopy is the technic of choice for inspecting and evaluating cases of vesicovaginal fistula.

Indirect air cystoscopy may be used in preoperative catheterization of the ureters when extensive pelvic surgery is contemplated.

It is believed that the technic of indirect air cystoscopy may add some facility and exactness to female urology, which has been developed, with urology in general, to one of the most exact medical sciences today.

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OBSTETRICAL PROGRESS IN THE SOUTHERN STATES*

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The hazards and problems of reproduction and resulting risks of maternal death are greater within the area of the Southern Medical Association than elsewhere in America. In the combined years, 1946-48, out of a total of 14,253 maternal deaths in the United States, over 6,800 occurred in the South. Thus 48.2 per cent of the maternal mortality was sectionally distributed in an area containing approximately 33 per cent of the population.

During the past two decades obstetrical progress in the United States has been characterized by a remarkable lowering of the maternal mortality rate which has declined from 6.8 per 1,000 live births in 1927, to 4.9 in 1937, 1.3 in 1947 and 1.2 in 1948. It is the attempt of this study to ascertain if obstetrical progress in the South, as represented by the geographical boundaries of this Association, has been proportionate to the advance of the nation as a whole; and secondly, to determine whether certain social, economic and racial peculiarities of this area play an important role in the risk of child bearing. From such factual data it is possible that further steps may be directed toward the reduction of maternal mortality and hence infant mortality risk. Should these risks be reduced, certainly as a corollary, maternal suffering, incapacity and disease would also be lessened, and further progress would be accomplished toward the ultimate goal of modern obstetrical science.

Population.—According to the 1950 preliminary census reports of the United States Department of Commerce, the population of the South (the District of Columbia and sixteen Southern states of the Southern Medical Association) has grown during the past decade to over 50 million persons. While the United States as a whole had increased 14.3 per cent, this area had a population growth increase of 11.2 per cent.

However, the Southern states are characterized generally by a high birth rate. In 1937, 39 per cent and in 1947, 36 per cent of the total live births occurred in this section where resided one-third of the American population. Three-fourths of the colored births in America take place in this area, creating by virtue of a low living standard, rural residency, and inadequate medical care, a medico-economic problem sectional in nature.

Physicians.—In 1940, 26.9 per cent of the physicians recorded by the American Medical Association were listed in the Southern states but by 1950 only 50,000 of the 201,000 physicians in the United States were so recorded. During a decade the number of physicians increased by only 7 per cent while in the entire United States there was an increase of 14.8 per cent in medical personnel. This slow rate of growth of the number of available physicians has been inadequate for certain phases of expanding medical needs. In consideration of the increasing numbers of people accessible to medical care, and an expanding social consciousness as to basic human needs, including health protection and medical treatment, together with enlarging medical facilities of

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both federal and local origin, the increase of available physicians in some sections of the South has lagged behind the advances of modern medical science.

However, an exception is noted in the development of medical specialization. As board certification has increased during the past decade the Southern states have participated relatively in this growth. Obstetrics and gynecology as a field of specialized medical practice following advanced training has been proportionate in its expansion in the South to the nation as a whole. In 1939, of 990 diplomats of the American Board of Obstetrics and Gynecology, 171 (17 per cent) were in the Southern states. In 1949, of 2,487 diplomats, 463 or 19 per cent resided in the area of the Southern Medical Association.

Economic Standards. — The relationship of family economics, as interpreted by per capita income, to purchasing power of medical care is obvious. The South from the standpoint of dollars available for human needs through individual earning power is still the poor section of the United States. According to the 1948 per capita income reports of the United States Department of Commerce this area, while participating in the postwar boom of the national economy proportionate to the national average, still suffers under a low economic standard. With a national average of $1,410 only 10 states in the union had a per capita income below $1,100. These states were all in the Southern area and in eight of these the per capita income was below $1,000 annually. Of thirteen states with a per capita income between $1,100 and $1,349, four were in the South. Only two Southern states (Missouri and Maryland) are in the remaining twenty-five states with a per capita income over $1,350.00.

However, a significant change in per capita income during the past two decades has occurred. In the Southeastern United States, consisting of eleven Southern states, average income rose from 51 to 68 per cent of that for the country as a whole. From 1940 to 1948 while the per capita income of the United States was increasing 145 per cent, in the Southeast the increase was 197 per cent, in Oklahoma and in Texas 189 per cent.

The frequently discussed "industrialization of the South" has contributed significantly to this income growth. However, while the factory payroll has advanced more rapidly than in the nation as a whole, and despite the gains in manufacturing accruing from a long uptrend, the South is not generally industrialized. In most states of the region manufacturing still accounts for a much smaller part of total income than in the nation as a whole, while agricultural income is two-thirds more than the national average.

This economic limitation of the South has been an important factor in maternal welfare and maternal mortality. The sectional disbalance in purchasing power is also a contributing cause in the difference in mortality rates between certain Southern states and the rest of the nation. Probably as a result of these social and economic problems, of the 1949 Federal funds for maternal and child health services, approximately 46.5 per cent was distributed in the Southern area.

Mortality.—The combined maternal mortality rate in the Southern states declined from 7.4 in 1927 to 6.0 in 1937, 1.9 in 1947, and to 1.7 in 1948. During the same years the national average declined from 6.8 to 4.9, to 1.3 and to 1.2 per 1,000 live births. Real progress in the South, in the face of economic handicaps, is apparent, although this progress when measured by mortality rate alone has failed to keep pace with the nation. While the national maternal mortality rate had diminished by 1947 to less than one-fifth of the 1927 rate, the corresponding improvement in the South was to approximately one-fourth of the 1927 rate.

The white mortality rate in the South of 5.9 in 1927 compared favorably with the national average of 6.1 and by 1947 had declined to 1.3 while that of the nation as a whole was 1.1. However in this year the white mortality rate in Virginia, Maryland and the District of Columbia was below the national average.

The colored mortality rate in the South of 11.4 in 1927 was below the national average of 12.5 but by 1947 had declined to only 3.6, nearly three times the rate for white women in the same states. However in this year (1947) in the Southern states of Tennessee, Missouri, Maryland, Louisiana, North Carolina and the District of Columbia, the colored maternal death rate was below the national average.

The geographical nature of this problem is accentuated by a study of the distribution of colored births among the various states. According to the National Office of Vital Statistics over one-fourth the live births in Mississippi, South Carolina, Louisiana, Alabama, Georgia, North Carolina and Florida are nonwhite. Seventy-five per cent of the nonwhite deliveries of America

occur in the South. In 1935, 83 per cent of the colored maternal deaths were in this area; in 1940, 86 per cent, and in the combined years of 1946-48 approximately 80 per cent.

Further study of these data by the Childrens Bureau reveals the serious lack of proper medical care for large numbers of these parturients. The absence of any medical attendant at delivery can be regarded as inadequate maternity protection at delivery and can also be construed as probably indicative of inadequate prenatal supervision. Such is the case with 69 per cent of the nonwhites in Mississippi, 66 per cent in South Carolina, 64 per cent in Arkansas, 59 per cent in Georgia, 58 per cent in Alabama, 54 per cent in Florida, 45 per cent in Virginia, 42 per cent in Louisiana, and 38 per cent in North Carolina. Only in the Southern states of Missouri, Kentucky and West Virginia were less than 10 per cent of the colored deliveries unattended by physicians. As only a negligible portion of the colored births occur in these states it is obvious that here the local medical profession has been adequate to absorb a major portion of the deliveries.

Hospitalization.—The discrepancy in hospitalization when the South is compared with the nation, and in the South itself when the races are compared, is a striking confirmation of the economic and medical inadequacies that still exist and is probably one of the most important causes for the high nonwhite maternal mortality rate of the South. During the years 1938-47, maternity hospitalization in the United States increased 75 per cent, reaching a new high in 1947 when 84.8 per cent of all deliveries were in hospitals and in 1948 when 85.6 per cent were in hospitals. In the South, ten years previously only 230,000, or 25 per cent of all living infants were born in hospitals. During the following decade hospitalization for delivery increased in the sixteen Southern states 168 per cent, reaching a new high in 1947 when 67 per cent of all deliveries were in hospitals.

The racial breakdown of deliveries reveals that in 1947 in the Southern states 77 per cent of all white deliveries and 34 per cent of colored deliveries took place in hospitals. In the remaining United States over 98 per cent of all nonwhite births occurred in hospitals.

Toxemia of Pregnancy.—Comparing the leading causes of maternal mortality in the South to the nation as a whole, a striking discrepancy as regards toxemia of pregnancy is noted. Of 3,800 deaths from toxemia in the United States during the combined years of 1946-48, 56 per cent occurred in the South. The white death rate from toxemia of pregnancy over the entire nation of 2.7 per 10,000 births is quite a contrast to the rate among Negroes in the South Atlantic area of 11.9, and in the South Central area of 12.3. A pregnant Negro woman in the South today has a 4½ times greater chance of dying from toxemia than a white woman residing anywhere in the United States. In the combined years of 1946-48, 85 per cent of all nonwhites dying from toxemia were in the South.

Rural Mortality.—That maternal mortality is a greater problem among residents of rural areas and smaller cities than among women residing in urban areas would be indicated by the following table prepared by the National Office of Vital Statistics:

MATERNAL DEATH AND MORTALITY RATES, BY POPULATION-SIZE GROUPS
1947

Area	Number	Rate
Urban	2,721	1.2
Places of 100,000 or more	1,175	1.1
Places of 25,000 to 100,000	551	1.2
Places of 10,000 to 25,000	367	1.1
Places of 2,500 to 10,000	628	1.6
Rural	2,257	1.5

For urban communities with populations over ten thousand the rate was approximately 1.1 per 1,000 live births, while in small communities of less than ten thousand and in rural areas the rates were 1.6 and 1.5 respectively.

Further application of the rural mortality rate to the Southern population is revealed in the map on this subject prepared by the Childrens Bureau (BS-10). Seven of the nine states in the union where over 65 per cent of the births are to rural residents, lie within the boundaries of the Southern Medical Association. The correlation of rural residency with difficult and often inaccessible hospitalization when in labor, and frequently with unavailability of medical care if financially impoverished, is apparent.

In 1947 over 28 per cent and in 1948, 26.6 per cent of the rural residents of America (population 2,500 or less) were delivered outside hospitals. During the last decade the relative increase in hospital births has been less marked in rural than in urban areas. This lack of avail-

ability of hospital care at delivery is more of a problem in the Southern area with its higher percentage of rural residency than elsewhere in America.

SUMMARY

Obstetrical progress in the Southern states when evaluated by the declining maternal mortality rate of 7.4 per 1,000 live births in 1947, to 6.0 in 1937, 1.9 in 1947 and 1.7 in 1948 has been striking. That this improvement has been slightly less than the national average is probably due to peculiar social and economic problems of the area involving the following factors:

(1) A low economic standard with 15 of 16 Southern states having a per capita income below the national average.

(2) Inadequate maternity hospitalization, especially for colored people.

(3) A widely scattered rural population.

(4) Lack of medical supervision in pregnancy and professional care at delivery for a large number of parturients.

That there is still a preventable mortality is indicated not only by these social and economic inadequacies but by the persistently high incidence of fatal toxemia of pregnancy in the South, especially in the colored race.

The white medical profession cannot justly be criticized for failure completely to absorb the colored maternity problems and obstetrical insufficiencies of this area. With only a 7 per cent increase in the medical profession in ten years it is obvious that the number of births and the wide rural areas involved, together with hospital and economic inadequacies would have made this physically impossible. The medical profession, in its branches of public health, medical education and private practice, has supplied capable leadership and frequently self-sacrificing service. In the face of serious handicaps maternal mortality has effectively been lowered by a comprehensive maternal welfare program, including public clinics, enlarged hospital facilities, and a higher quality of medical care. In a number of states the results have been outstanding, particularly North Carolina and Maryland, where both white and colored mortality rates in 1947 were equal to or below the national average; and Tennessee, Louisiana and Missouri where the colored mortality rate in 1947 was also below the national average.

Just what is the future responsibility of the medical profession concerning maternal welfare in the Southern states? It is certainly our duty to be well informed and to be aware of existing inadequacies and limitations in the distribution of medical care, especially in the important field of reproduction of the human race. A social conscience that can face realities and guide the way in improving human welfare in both health and disease is a responsibility of organized medicine that cannot be challenged.

A study of obstetrical progress in the South reveals two existing needs that persist in spite of a marked reduction in maternal mortality during the past decade. They are first, an improvement and expansion of hospital facilities for maternity patients, especially of the colored race, and second, more adequate professional supervision of every parturient through pregnancy and delivery.

To accomplish an enlarged medical program of this nature it appears that more colored physicians should also be educated, who might participate in improving maternal welfare standards in the Southern Negro population. An acceptance of some degree of such educational and training responsibility by the Southern medical profession should result in further obstetrical progress in the Southern states.

THE SOUTH'S SERVICE TO THE CRIPPLED CHILD*

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The crippled child has connotations other than orthopedic. The term "handicapped" is more humane as well as more comprehensive. A liberal interpretation of the term could include any impairment, physical or mental, which incapacitates the child for competing on equal terms with the normal. While this may not be possible to accomplish, it is an ideal objective to be attempted in each individual case. The potentialities of these children should be developed to make the most of their native ability.

The United States Census Bureau in 1944 estimated that there were over forty-six million persons in this country under twenty years of age.

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One-third are in the Southern states. The estimated yearly birth increase is two and three-quarter million.

It is almost impossible to determine the number of children in the United States eligible for crippled children service but it has been estimated as shown in *Table 1*.

The burden of the location, evaluation, and treatment of these handicapped potential citizens is met by many interested agencies. They include national, state, county, and municipal governments, also various social agencies and civic clubs. The National Polio Foundation, the National Society for Crippled Children and Adults, the Anti-Tuberculosis Association, the American Heart Association, the National Associations for the Blind and Deaf are largely educational. They do have, however, local chapters which, in addition to their educational program, sometimes conduct clinics and render service to children who are eligible for their care. Many health departments, state, county, and municipal, have programs for the care of the handicapped child. Various hospitals, municipal and college, have facilities to render service. Special programs for the crippled child such as those operated by the Shriners, Elks, and civic clubs help carry the load in their respective localities.

An attempt to cover all organized help for the handicapped child in our Southern territory would be too involved and would surely unintentionally overlook some large and useful service rendered in many localities. Full credit and praise is therefore given for service to the handicapped child in all states in our jurisdiction.

Due to my connection as part time pediatrician to the Georgia state crippled children's program, I thought it might be of interest to review as thoroughly as the time will permit, this particular program in each state and the District of Columbia comprising the territory of the Southern Medical Association. All these states and the District of Columbia have programs under the State Crippled Children's Service. These programs are financed jointly by state and federal funds and are administered locally by designated agencies.

Federal funds available for inclusion in original annual budget for fiscal year 1951 from grants to states for services to crippled children under Title V, Part 2, of the Social Security Act, as amended (subject to Congressional appropriation), are shown in *Table 2*.

Fund A is matched by each state. This grant is $30,000.00 plus an additional amount based on the number of children under 21 years of age in each state as of 1948.

Fund B is a direct grant not having to be matched. Each state has a minimum of $10,000.00, the additional grant also based on the number of children under 21 years of age. Children in the rural areas are allowed twice the amount of those of the urban.

In addition to these regularly allocated funds, some federal and state money is spent for special demonstrations.

In assembling data I had hoped to arrive at the total each state had for the crippled children service but this information was not forthcoming.

Since compiling this information I received a notice that the federal grants for the Crippled Children Services will be doubled for 1952. There will be available, therefore, 15 million dollars instead of the present 7.5 million. The Southern states will get their share based on the number

Orthopedic	500,000
Cerebral palsy	176,000
Epilepsy	200,000
Defective hearing	1,000,000
Active tuberculosis	175,000
Rheumatic heart	500,000
Diabetics	20,000
Visual defects	4,000,000
Dental defects	20,000,000

Table 1

State	Fund A	Fund B
Alabama	$ 81,761	$ 94,106
Arkansas	63,438	62,420
District of Columbia	40,604	10,000
Florida	64,738	28,019
Georgia	84,565	90,181
Kentucky	77,699	85,544
Louisiana	73,473	63,201
Maryland	60,675	10,000
Mississippi	68,841	81,698
Missouri	83,712	48,359
North Carolina	96,063	123,230
Oklahoma	67,094	52,011
South Carolina	67,826	69,623
Tennessee	82,777	86,036
Texas	145,468	150,246
Virginia	78,877	68,491
West Virginia	62,950	47,412

Table 2

of children under 21 years of age, their financial needs, and the relative number of rural children.

The increased grants will be used to extend present services to reach more children, care for handicaps where no public service is available, and to train more workers. It will also help to cover the increased cost of hospitalization which has risen in ten years from $6.42 to $18.06 per day per patient.

The urgent request of most states is for more money. In answer to my questionnaire as to the needs and recommendations one reply was, "Money, more money, plenty of money." This is the dream of all personnel in order that adequate care may be given the registered cases, that the service may be broadened and the term crippled child expanded to include any condition that handicaps, not necessarily just orthopedic.

The program in the various states does not operate under the same state agency. Nine states, Kentucky, Louisiana, Maryland, North Carolina, South Carolina, Tennessee, Texas, Virginia and District of Columbia function under the Department of Health; three operate under the Department of Public Welfare, Arkansas, Georgia and Missouri; two under the Department of Education, Alabama and Mississippi; two under Children's Commission, Florida and Oklahoma; and one under the Department of Public Assistance, West Virginia.

Every state and the District of Columbia has service for children with orthopedic and plastic defects, also for cerebral palsies and congenital abnormalities.

Eight states care for congenital hearts; nine have programs for rheumatic hearts; three states care for speech and for hearing; five states serve the blind; two, mental defects; and one, brain tumors (*Chart 1*). It can be seen that the majority of the Southern states care for only a small percentage of crippling conditions under the broader interpretation of the term. Fifty-eight thousand children received service in 1948.

Of the medical personnel, all states have orthopedic, pediatric, and nursing service; nine have neurologists; three, plastic surgeons; four, dentists; one has a doctor of physical medicine; and six have cardiologists (*Chart 2*).

Of the auxiliary personnel three states have a nutritionist; eight have teachers for speech therapy; fifteen have physical therapists; fifteen have medical social workers; and seven have a psychologist. None has teachers to maintain an educational program. The Department of Education in many localities does furnish teachers in convalescent homes and hospitals for the handicapped (*Chart 3*).

There is a great discrepancy in various parts of the country in the ratio of children to adults. In the far west the ratio is thirty-two children to one hundred adults, while in the South the ratio is fifty-seven children to one hundred adults. We know that the lowest income group carries the heaviest load of children. In the cities of 100,000 or more population the relation of children to adults is thirty-one to one hundred adults. In the farm population there are sixty-two children, twice as many, under fifteen years of age to one hundred adults. Since the cities draw their strength from the farmers of the nation it is

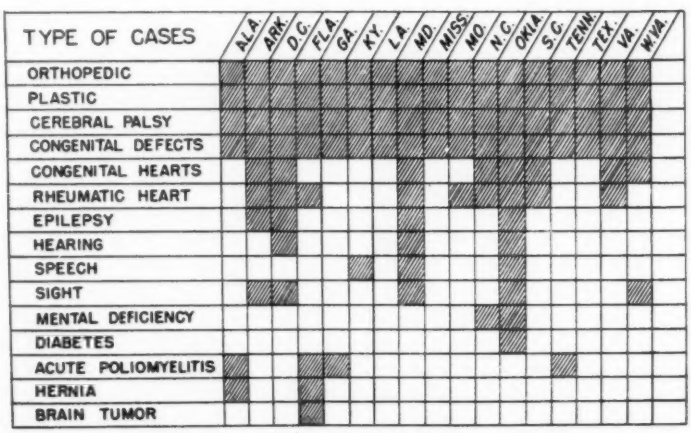

Chart 1

essential to both urban and rural areas that the children of the rural areas be given adequate care.

Families in the United States according to the 1947 census had an average medium income of $3,000; colored had $1,600; the rural nonfarm families with four or more children under eighteen years of age had an average income of $2,935; the rural farm worker with the same size family had an income of $1,727. It is obvious that when a crippling condition hits one or more of this family group they cannot afford to pay for the needed service yet, statistically, these families would most likely be the ones involved in a crippling defect. The South has 21 per cent nonwhite population, United States 1 per cent. Two-thirds of the nonwhites who received service were in the South.

Much of the population comprising the territory of the Southern Medical Association is rural of low economic status and has the largest families. For this reason we should know the problem, plan for the correction of defects, and appeal for ample funds to restore these children, if possible, to economic independence, making them an asset to the South as well as to the nation.

In the pamphlet published by the Children's Bureau, "Facts About Child Health," are listed nine needs for the health and growth of every child. We shall assent to every one of them. It is unfortunate that many of the patients we see at the Crippled Children's Clinic in Georgia receive very few of the needs that are considered essential. I presume that Georgia is typical of the conditions in the entire South.

CHILD NEEDS

(1) To be well born.
(2) To be secure in a home free from economic worries.
(3) To be well fed, with balanced diet and ample vitamins.
(4) To be well housed.
(5) To have a guided personal growth.
(6) Good daily care.
(7) Protection against disease.
(8) Proper treatment of handicaps or illness.
(9) To learn to protect his own health.

Much has been said, correctly, about inadequate medical care. From a large majority of our clinic cases, practically the only needs fulfilled from the above list are given when they enter school or have an illness or disability. Extending educational facilities, broadening and improving

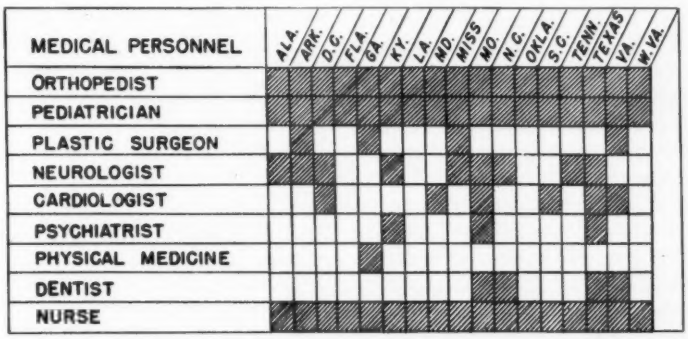

Chart 2

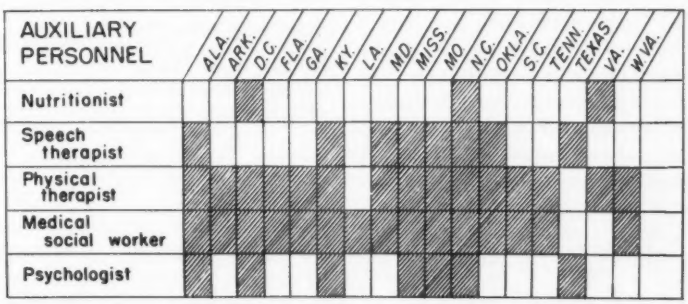

Chart 3

the maternity and child health programs will no doubt eventually, with the assistance of health departments and allied organizations, aid a large majority of parents to reach a higher degree of knowledge, interest, and ability in caring for their children.

RECOMMENDATIONS

(1) Expansion of program to make service available to all the handicapped unable to secure for themselves adequate care.
(2) Parenthood not for all. Physical and mental handicaps should not be transmitted on and on if the first of the essential needs is that a child be well born.
(3) Proper spacing and limitation of children so that adequate care may be given each child intrusted to parents.
(4) Increased grants to meet all needs.
(5) Statewide coverage.
(6) Improvement of quality of service.
(7) Correlate activities to prevent overlapping.
(8) Equalization of program for all the states with modification to meet local conditions.
(9) Clinical material made available for teaching purposes.

This may seem to be a predetermined model plan which could be an entering wedge for state medicine. On the contrary, the federal financed crippled children's service operated in each state is a local program approved and partly financed by the Federal Security Agency. In many states the local medical groups render service on a fee basis rather than on part time salary. There is close cooperation between the state social agencies and medical facilities necessary to render service to the indigent or to a group whose income is insufficient to obtain highly specialized and expensive service. The united efforts of all activities for the crippled child is an evolutionary process built up with the help and cooperation of the medical profession. This is a good example of how federal and state funds may be used locally for the advantage of the handicapped.

The object of this report has been to acquaint you with what is going on in your state as compared with the other Southern states. Each state needs our respective cooperation to secure additional funds, increased well-qualified personnel, and expanded facilities of good quality to further the needs of the handicapped child in the South. We can do this best by active cooperation and by participating in directing the program in our respective states.

33 Ponce de Leon Avenue N.E.

THE RELATIVE IMPORTANCE OF CHEMOTHERAPY, ANTIBIOTICS AND SURGERY IN THE TREATMENT OF ACUTE OTITIS MEDIA AND MASTOIDITIS*

By WM. D. STINSON, M.D.
Memphis, Tennessee

This paper is admittedly more philosophical than scientific, designed to point up and emphasize the abuse of valuable therapeutic agents. It is significant that in one evening's reading I encountered an article in the *Archives of Otolaryngology* by Lederer on the same subject, a featured article in *Time* magazine, and in *Medical Economics* a cartoon showing two youngsters in a physician's reception room, one saying to the other, "Regardless of what he finds, you'll end up with penicillin!"

The use of chemotherapy and antibiotics in all febrile conditions has now become as general, and with as little clinical basis, as quinine and calomel fifty years ago. Not only have many of our otologists entered practice since the advent of these agents, but also pediatricians, who are lacking in an otologic background and training, see the majority of otologic patients first. The latter, being primarily internists and therapists, naturally attribute the results to the therapy administered. There is a tendency either to exhibit the fatalistic attitude that an infection not responding to antibiotics is hopeless and the prognosis *nihil*, or else to deluge the patient with all known agents in astronomical doses.

A case in point is a seventeen-year-old boy admitted to the Baptist Hospital with a history of a discharging ear since infancy. Two weeks previously he developed high fever and chills, which had not responded to penicillin.

On admission, he had a fluctuant superficial abscess in the right neck, which was incised and drained by the resident. X-ray of the chest showed metastatic abscesses in both lungs. Blood culture and culture from the abscess showed Bacillus proteus. He was placed on sulfadiazine by mouth, penicillin, 1,000,000 units daily, intravenously, and streptomycin, aureomycin and chloromycetin. The laboratory reported the organism not sensitive to any of these agents, except slightly so for streptomycin.

The following day a complete mastoid operation was performed and an epidural abscess lying over the sinus

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was drained. The temperature, which had been extremely septic in type, immediately levelled off at around 101.° Two days later, the consultant in thoracic surgery reported empyema in the left chest. Thoracentesis followed by rib resection two days later resulted in an immediate drop in the temperature to 100° and the boy eventually made a complete recovery. While this is a dramatic case, it, to the otologist who practiced before chemotherapy, is not sufficiently rare to be considered a miracle. It is cited because the resident wrote on the chart:

"Sensitivity tests show no inhibition of the organism by aureomycin, chloromycetin, or penicillin. Only slight inhibition with streptomycin. Outlook hopeless."

The statement is frequently made that "penicillin and the sulfa drugs have eliminated otitis and mastoiditis."

I seriously question the merits of this statement and present the following observations in support of my opinions.

Clinicians who practiced in the days before chemotherapy know that the incidence of respiratory infections, particularly those involving the ear and sinuses, is cyclic in both course and character, and in the structure involved, and that the cycle varies not only in severity, that is, in becoming surgical or resolving without surgery, but also in the incidence and gravity of complications, and even in the time from onset at which these phenomena occur.

Historically, in Memphis, there was a high morbidity of virulent otitis media or mastoiditis in 1927-8-9, with high incidence of surgical mastoiditis. In 1930 there was a definite drop in incidence, which by 1932 had reached the low point which remains today. This was four years before the advent of any of the sulfonamides and several years before the deluge of antibiotics. In the period of high incidence there were definite cycles apparent to the sound observer or clinician.

These cycles were characterized as follows:

(1) Myringitis of short duration and rapid resolution without serous or purulent otitis media.

(2) Acute otitis media requiring paracentesis, or rupturing spontaneously with recovery without complications.

(3) Bullous myringitis, simulating acute otitis media and mastoiditis, but resolving spontaneously in a short interval.

(4) Acute otitis media manifesting signs and symptoms of mastoiditis within the first ten days of onset with a high percentage resolving without surgery and with complete resolution of the otitis media.

(5) Acute otitis media manifesting mild mastoiditis usually around the fifth to the seventh day, the mastoiditis resolving about the tenth to the twelfth day, persistence of the otitis with recurrence of the mastoid symptoms around the seventeenth to the twenty-first day, a high percentage becoming surgical mastoiditis.

(6) Fulminating otitis manifesting mastoiditis from the fifth to the seventh day with surgical intervention definitely indicated by the tenth to the twelfth day.

In spite of these varied clinical courses, and even though there was no effective antibactericidal agent available, not only was the mortality of otitis media and mastoiditis, surgical or otherwise, not excessively high, but the incidence of major complications, such as sinus thrombosis, meningitis and brain abscess, was far less than in those active cycles of 1900-1908 and again 1914-1918.

These are all classical manifestations of otitis, set forth in all the texts and familiar to all otologists antedating chemotherapy and antibiotics. We all remember mercurochrome,® "omnadin," Colle's serum, intravenous dyes and other agents which had their periods of popularity, all of which were eventually abandoned.

Most of the ear manifestations are reflections of an upper or complete respiratory system infection, their course paralleling exactly that of the respiratory infection, and the accompanying fever being due to the respiratory rather than, or as well as to, the otitis. The otitis usually resolves with the respiratory infection. Chemotherapy and antibiotics are routinely administered and the resolution of the infection is attributed to these agents.

As an otologist in private practice, I offer these items for consideration:

(1) Acute respiratory infections are in the individual case extremely variable in their course and manifestation, but fairly consistent in the group. That is, given a prevalent infection, after a day or so, a fairly accurate prediction of the course can be given on the basis of experience with other cases seen at the same time.

(2) Using no antibiotics or chemotherapy, my cases run a course identical with those receiving these agents at the hands of other physicians.

(3) A large group of cases I now see come to

me originally at the first symptoms of otalgia, because the parents, having had a previous winter of recurrent otitis with repeated use of these agents, have lost faith in their efficacy. They have read of the harmful results of repeated use of these agents and the child has developed such a fear of the needle that it is an ordeal for both patient and parents to repeat this experience. Carried along on the principles of otology used before the advent of these agents the course is the same, simple otitis resolving in 48-72 hours with paracentesis rarely necessary.

(4) In the last four years I have had no case of mastoiditis in which I attended the original otitis; while conversely, every case of mastoiditis that I have seen has had these agents from the beginning. None of these cases of mastoiditis, astoundingly, has had a paracentesis. The drum, according to the history, ruptured spontaneously, or a subperiosteal abscess developed with an intact membrana tympani.

That there are harmful effects from chemotherapy and antibiotics, is well known. Giant urticarias, allergic bronchitis simulating "virus pneumonia," hematuria and kidney blocks appear frequently in the literature. There is increasing evidence that catarrhal otitis media is becoming more prevalent and is not being recognized. Ophthalmologists are calling attention to the proptosis and exopthalmos that persist after treatment of orbital cellulitis from the frontal sinus or ethmoid, which has apparently resolved under these agents. What then is a logical use of these valuable adjuncts to the treatment of infections?

(1) The principles of otology have not changed and should be followed just as exactly as before the advent of these agents. Given the objective indications for paracentesis, it should be performed regardless of pain and fever, to preserve hearing and prevent mastoiditis. However, the indications for a paracentesis are much more clearly defined today than they used to be. Few otologists believe now that every red drum should be incised. I rarely incise a drum that still shows any area of transparency, that still has any of the landmarks present. If there is no pain I do not do a paracentesis in the first twenty-four hours, regardless of what the drum looks like, except in an acutely ill patient who shows no other cause for his illness.

(2) Given the definite objective signs of mastoiditis, an operation should be performed, regardless again of the general picture.

(3) When should chemotherapy and antibiotics be used?

(a) Public pressure is an admitted factor. Given a distracted parent, particularly one with whom the physician has had no experience, if a tactful stating of his views does not meet with satisfaction, I frequently yield to the pressure. Many an egg laid in the first visit will have hatched by the second, especially if one has gained the patient's confidence on the first visit.

(b) Routine administration is neither indicated nor necessary. Given a prevalent respiratory infection or an epidemic running a consistent course regardless of treatment, it should be withheld.

(c) Given a history of recurrent attacks with administration during those attacks, which ran the expected course, it is withheld.

Chemotherapy and antibiotics should be given in:

(1) Fulminating otitis without a paralleling acute respiratory infection to account for the systemic symptoms.

(2) All cases requiring paracentesis.

(3) All cases showing signs of mastoiditis or any indications of extension beyond the middle ear.

These are the categories in which it is withheld, and in which it is administered.

In those in which these agents are indicated the following rationale is indicated:

Lacking a response in 48 hours the organism involved and its sensitivity to a specific agent should be determined. Blood levels of that specific agent should be ascertained and the dosage altered accordingly. Never send a boy to do a man's work, is an old adage. Signs of developing reactions or untoward complications from the agent should be watched for carefully and treated either by specific measures or discontinuance of the agent, depending upon the relative importance in each case. It should be borne in mind at all times that these agents may mask the classical signs of mastoiditis, hence a finer evaluation of these signs is indicated. Finally, all cases should be kept under close observation for 72 hours after discontinuing the treatment, and all cases of otitis media and/or mastoiditis should be carefully examined one month after complete resolution for possible catarrhal otitis media.

In conclusion, I do not believe the routine administration of antibiotics and chemotherapy is indicated in acute otitis of the present day, most of which is little more than an acute myringitis or serous otitis of low virulence; and by comparison of those cases which have and have not received these agents I see no variation in the course which would indicate their effectiveness.

HOW INDUSTRIAL HEALTH CAN EXTEND ITS SCOPE OF SERVICE*

By GRADIE R. ROWNTREE, M.D.†
Louisville, Kentucky

As a nation, we are beginning to realize the importance of a certain group of society, the working population. This is a highly important group because it currently is carrying the financial load for many more individuals including the unemployable and the old. Thus, conserving the health and extending the years of productivity of the employed becomes a responsibility of the medical profession, of industry and of governmental agencies.

The question is: how can these three groups fulfill their responsibility of maintaining the health and prolonging the useful years of a larger segment of society?

First, our goal, as doctors, is to extend industrial health services to reach all workers in whatever vocations they may be, both urban and rural. Every establishment employing people, no matter how small a group, should have some arrangement for providing at least the basic elements of an industrial health program. Secondly, many older persons and even many handicapped persons may well be fitted to continue their contribution to society through more emphasis on their long range well-being. Thirdly, because people are living longer today than formerly, the chronic diseases are taking a greater toll. The search for methods to control these diseases constitutes medicine's greatest present challenge.

EXTENDING SERVICES TO MORE WORKERS

At present, industrial health services reach only a small percentage of the employed population. There are two main causes for this. The large majority of workers are employed in small plants not able to afford health services and many large plants simply have not provided such services. As physicians, we should take the lead in working out a plan by which employes in small plants may have the services of an industrial health program at a cost which the establishment can afford. And we can take the lead also in making larger industries realize that health service for their employes is a good investment.

The group plan is already established as one way in which the small industry may provide health services for its employes. A number of small plants in the same general area can jointly employ medical and nursing personnel to put on the program. Group plans of this type are working successfully in several places. Another plan is the industrial health clinic arrangement. Here a physician or a group of physicians maintains an office and provides medical, nursing and laboratory service for plants on a fee-for-service basis.

Unfortunately, neither of the above plans adequately answers the problem of the small town and rural population, but here the necessity is no less great. The use of mechanical equipment and new chemicals in agriculture have caused an increase in the occupational accident and disease rate of the farm worker. The physician in rural areas has the obligation to concern himself with the protection of such workers. In the small town, the physician can offer pre-placement and periodic examinations as well as emergency medical care through an arrangement with the employer of, say, a dozen or fewer employes. The physician also can acquaint such employers with principles of accident and occupational disease prevention or instruct the workers themselves in such knowledge.

But there is an added obligation on the part of the physician. Approximately 85 per cent of the medical care now given to industrial workers is provided by private practitioners. Therefore, physicians in general are obligated to acquaint themselves with the health problems that arise in industry. The physician in private practice should interest himself in the total problem of industrial medicine. He should have knowledge of the different phases of industrial health and know something of the occupational hazards and disease to which his patients may be exposed.

For the undergraduate in medicine, this may be accomplished by the inclusion by medical schools

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of courses in industrial medicine in their curricula. For the man already in practice, industrial health institutes and postgraduate courses offer opportunities, through local and state medical societies and medical schools, for acquiring the knowledge and technics. In a few states, in addition to didactic lectures, clinics are held in plants. The physicians are taken on plant tours so that they may see the worker at his job in foundry, at printing press and lathe. Seeing the various operations gives the physician a better understanding of the physical demands of the work on his patients.

Industrial health services in state and local health agencies are at the present time inadequate both in personnel and financial support to give industry the help it needs. This is true even for environmental sanitation. Many employes are working in plants, even in plants that are not small, where sanitary conditions are such as to be a real menace to the health of the worker.

Insufficient or no toilet facilities, a contaminated water supply or no provision for drinking water at all, and no facilities for hand washing are found in many places of employment. These conditions many times are allowed to continue because sanitary inspectors in health departments have not yet extended their inspection services to industrial plants.

Correcting insanitary conditions in industry is only a part of the job which the health department should do. Through its engineering staff it can assist the employer in understanding the importance to the worker of good lighting, ventilation, cleanliness, protection against noise and overfatigue, rest periods and avoidance of overcrowding in his plant. Too few industrial health divisions in official agencies offer any medical and nursing services to industry.

Especially in plants where there is no health program should health and safety education for industrial workers be one of the important activities of the public health agency. Such agencies can offer articles for plant and union magazines, talks, movies, nutrition classes and other health material to the worker.

THE HANDICAPPED AND OLDER PERSONS

Industry should strive constantly to make more opportunities for placing handicapped workers in jobs fitted to their capabilities. In many instances it has been shown that handicapped workers have a better production rate than the able bodied. The physician must assume responsibility for informing the employer of the physical capabilities of such workers: of the convalescent, handicapped and the older worker.

After a worker has been ill or injured, it is important that the physician responsible for his care see that the patient returns to work as early as he can safely do so. Early return to work in such cases benefits the employe in building his morale, re-establishing his income and giving him better job security. In so doing, it also aids industry by helping it maintain a force of reliable workers and by improving the worker-management relationship.

CONTROL OF CHRONIC DISEASES

Control of chronic diseases at the present time depends almost entirely upon early discovery and prompt treatment. This may be accomplished by extending the process of periodic examinations to more employes. The cardiovascular diseases, cancer, nephritis, diabetes, syphilis and tuberculosis thus can be found early. Immediate treatment can be instituted and the activity of the individual can better be adjusted to his physical ability. Here, again, the private physician plays an important part both in early discovery and early treatment and in helping the individual to extend his usefulness and productive years of life.

Another useful tool in case finding in industry is the group of rapid screening tests for the just-mentioned diseases. These tests have been used successfully in some communities and their further use should be explored. The conference with the patient following his pre-employment examination often results in the correction of remediable defects which, if uncorrected, may later cause serious trouble.

To sum up, in extending the scope of industrial health service, three groups should cooperate. They are the medical profession, the governmental agency and industry itself. The understanding and cooperation of the individual is essential to best results.

All this does not of course add up to the advocacy of a complete medical care program in industry. But the private physician must take the lead in improving the conditions under which large groups of people must work, and in the prevention of both occupational and nonoccupational diseases and accidents. Trade unions and general labor groups more and more are showing interest in the establishment of medical care programs. Unless the private physician assumes his

responsibility for maintaining the health of the worker, labor itself may take control of the medical care of its members. This could have the same effect of socializing medicine as would government control of medical care.

Finally, industrial medicine today probably is doing more in health maintenance than any other branch of medicine. The beneficial results that are being widely shown by this interest, point up the necessity of finding ways to extend this type of service to an ever-increasing number of people. Worker and industry alike are benefiting from industrial health programs and their effects are correspondingly spread throughout the communities in which they operate.

THE RELATION OF PUBLIC HEALTH AND MEDICAL PRACTICE*

By T. F. SELLERS, M.D.†
Atlanta, Georgia

It has not been so many years ago that the differentiation between public health and medical practice was very sharply drawn and rightly so. Public health was a relatively new field, limited to regulatory sanitation of premises, food and water supplies; to pitifully inadequate investigations of major outbreaks of communicable diseases, and to a limited extent to diagnostic laboratory service. Organized local health departments were confined to a few of the larger cities. Sanitation was in the form of police inspection and enforcement of regulations and ordinances. Public health engineers, nurses and other specialized trained professional personnel were unknown.

Communicable diseases were rampant and of wide variety, both endemic and epidemic, being regarded by the public and the medical profession as a matter of course. As compared with present-day standards medical practice also was more largely limited to bottles and pills, or shall I say pharmaceutical therapeutics with too little attention given to preventive and control measures. This attitude was not due to lack of concern or interest, but to the absence of knowledge at that time of effective preventive and control technics.

It is not surprising, therefore, that the scope of public health in this adolescent period was so sharply circumscribed as not to be dignified by the medical profession as within the pale of medical science.

Let us skip over the intervening years and compare the practice of public health today.

Through the combined efforts and accomplishments of research and accumulative knowledge in the fields of medical, biological, chemical and physical science, public health and the practice of medicine have been steadily drawn so close together that their interests have merged into a common objective, the conquest of disease in all its forms, and of the many factors of our physical and social environment which predispose to disease.

To illustrate the dynamics of public health as it is practiced today throughout the nation, I shall cite the pattern of public health organization in my own state, Georgia. Under the control of a State Board of Health, composed chiefly of physicians selected by the Medical Association, the State Department of Public Health is supervised by a medical director. There are no less than fifteen specialized divisions of service available to the people and to the medical practitioner. These include environmental sanitation, food, water and sewage control, communicable disease epidemiology, maternal and child health, tuberculosis and venereal disease control, health education, vital statistics, mental hygiene, cancer, heart programs, dental health, industrial hygiene, diagnostic and central laboratories, hospital licensure and construction, and a number of other specialized services. Each service is operated by specifically qualified and trained workers, including doctors, dentists, nurses, engineers, sanitarians, biologists, bacteriologists and technicians trained in a variety of specialties, including administration, accounting and clerical service.

All of these specialized divisions channel their services through the Division of Local Health Services to local health departments, which are the basic units of service to the practicing physicians and the people. It is true, of course, that neither local nor state health services are adequately implemented because of lack of trained workers and of funds, but the pattern is well established on a substantial basis.

This ever-widening scope of public health could never have been attained without the positive support and active participation of the practicing physician. For example, the cancer program in Georgia, as well as in many other states, was

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instigated by the Medical Association. Our new program of diabetic case-finding and follow-up care was initiated by requests from a prominent practitioner who in previous years was strongly opposed to any public health activity beyond the realm of sanitation and communicable disease control. Our programs of mental hygiene, heart disease, maternity and child hygiene, and tuberculosis are operated jointly with local private practitioners. Many states are gradually developing programs of medical care for the indigent under public health supervision. In our own state, many medical leaders are advocating the operation of a state general hospital by the State Health Department.

It is true that there are yet those in the medical profession who view with alarm and skepticism the participation of public health in projects of case finding and care of chronic illnesses chiefly because many such services and programs are supported by Federal grants-in-aid, "Another foot in the door leading to state medicine and governmental regimentation," they say. We all know that there has been some justification for this fear, but public health physicians are just as allergic to governmental interference as is the practicing profession. The recent stand voiced officially by both the State and Territorial Health Officers Association and the American Public Health Association against compulsory health insurance is adequate testimony of this position.

In problems of military preparedness and civilian defense, our nation is facing the gravest crisis in its history. All too soon our medical and public health manpower resources are to be taxed most severely. Our defenses can no longer be limited to the battle lines. It is therefore fortunate indeed that we have attained a common denominator of mutual understanding and teamwork with public health and medical practice.

LARYNGEAL EMERGENCIES IN INFANTS AND CHILDREN*

By GEORGE S. MCREYNOLDS, M.D.
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The diagnosis and treatment of laryngeal emergencies in infants and children resolves itself into the differentiation of the various obstructive lesions of the larynx that may occur in the younger age groups. For the most part, these lesions may be intrinsic, as far as the larynx is concerned, as in inflammatory lesions; they may be due to tumefactions; they may be due to trauma, or to several other causes. These different types of cases that present laryngeal emergencies will be discussed from the etiologic and therapeutic point of view, together with the important question of the differential diagnosis.

First, congenital lesions may constitute an emergency. For some time it has been our feeling that a congenital atresia, or a congenital stenosis, may be the actual cause of death in many cases that are diagnosed as stillbirths or asphyxia neonatorum. An ideal situation would be that a laryngologist be present at each delivery for a quick inspection of the pharynx and larynx, and an aspiration of the trachea. However, it seems impossible to accustom a laryngologist to the hours of the obstetrician unless one has a large resident staff. As a good substitute, the pediatrician should be trained to perform laryngoscopic examinations in infants. In general, the obstetrician and pediatrician seem content to continue with blind mouth aspiration until several days have elapsed, if the infant should survive as long as that. Admittedly, this is sufficient in a large majority of the cases. It is the exceptional case that demands emergency treatment.

In an infant with respiratory difficulty at birth, the differential diagnosis involves the question of a partial web formation, so-called congenital laryngeal stridor, pulmonary atelectasis, or a congenital atresia or stenosis of the esophagus with a spilling over of secretions in the larynx. Also, cerebral hemorrhage, due to trauma in the birth canal, should be included because it is not unusual for the laryngologist to be asked to see these patients in order to exclude a laryngeal or pulmonary lesion. In forceps delivery it is possible to produce sufficient traction on the head to cause damage to the vagus or recurrent laryngeal nerve. There is also a condition described as a congenital paralysis of the vocal cords due to a lesion of the nerves. A family in which three generations were identically affected has been reported in the literature. We have seen two such cases that fall into this category. One of these cases had other congenital defects, particularly related to the central nervous system. The other was too young to ascertain other defects. Both of these infants required tracheotomy for relief of the obstruction.

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Of course, the final diagnosis is dependent mainly upon direct examination of the larynx. If the infant is in acute distress, this may precipitate a tracheotomy. Because of this fact, one should always be prepared to perform a tracheotomy at the time of the direct examination. It might be well to emphasize here the value of the insertion of a bronchoscope preliminary to tracheotomy, particularly in children. In any case of laryngeal obstruction, a bronchoscope may be inserted through the stenosed larynx and the obstruction instantly relieved. This then converts an emergency operation into an orderly, anatomical, surgical procedure. In addition, it simplifies the operative procedure, particularly in children, by making the soft, flexible trachea of the child more rigid.

It is very questionable that anything can be done in cases of atresia of the larynx, since the patient will probably be dead before any remedial procedure can be accomplished. However, in cases of congenital webs of the larynx, it may be possible to incise one side of the web along the apparent margin of the vocal cord and increase the glottic lumen. Following this, one must carefully observe these cases to prevent readherence of the web.

Fortunately, in cases of congenital laryngeal stridor, rarely is any treatment necessary since these are fairly common. Almost all of these cases will develop without surgical intervention. As the infant grows and becomes better nourished, the symptoms disappear. Only rarely is tracheotomy necessary.

It is obvious that surgical intervention is immediately necessary in a case of congenital atresia of the esophagus, both for protection of the pulmonary system and for nutrition. Some cases of congenital stenosis of the esophagus may be treated conservatively by dilatation through the esophagoscope.

Inflammatory lesions of the larynx in infants and children may produce an emergency. This is due to the relatively small lumen of the glottis. These inflammatory lesions may be divided into specific and nonspecific infections. Of the specific infections, diphtheria is still the most common. In the modern days of preventive medicine, one would expect diphtheria to be an infrequent condition. However, in spite of all the educational programs in our schools and parent-teachers associations, never a winter passes that we do not see several cases of laryngeal diphtheria. Most of these have some degree of laryngeal obstruction, and a few require tracheotomy. Because of the possibility of diphtheria, every child with an acute laryngeal obstruction should have a direct laryngoscopy both for inspection and to obtain material for smears and cultures. At times it is possible to aspirate a sufficient amount of the membrane to relieve the obstruction and prevent the necessity of a tracheotomy. We still prefer tracheotomy to intubation in diphtheritic infections because it is not unusual to see the membrane extending down the trachea or even in the major bronchi. Without preliminary bronchoscopy and aspiration through the bronchoscope and the tracheal cannula this portion of the membrane could not be removed.

The most common nonspecific infection we see involving the larynx is an acute laryngotracheitis or laryngotracheobronchitis. Much has been written about the diagnosis and treatment of this condition. Nevertheless, it is still a very important problem. It is relatively easy to convert a case of acute laryngotracheitis from a case of laryngeal emergency to some other problem by simply performing a tracheotomy. Unfortunately this does not usually solve the problem but merely substitutes another problem. The aftercare of a tracheotomized case of laryngotracheitis is equally difficult, or in many cases, more difficult than before the performance of the tracheotomy. The drying of secretion in the trachea and bronchi can often be a serious problem. Some of this difficulty may be overcome by humidification of the room with mechanical humidifiers. With the newer "wetting agents" much of this difficulty may be minimized. Our experience with these has been limited but others have reported excellent results.

The important problem in these cases is to decide upon the optimum time to perform the tracheotomy. If one waits too long the results may be disastrous. Likewise an unnessarily early tracheotomy may result in a difficult therapeutic problem. If one can be sure of adequate, intelligent nursing care, it may be better to err on the radical side. If an infant or child shows any signs of restlessness, indicating air hunger, a tracheotomy should be done. If one waits until cyanosis develops, injury to brain tissue may have occurred and irreparable damage may be done. As has been stated before, the use of wetting agents, both before tracheotomy is imminent and also after tracheotomy has been performed, may pre-

vent many of the complications previously encountered.

Davidson has discussed the other type of acute laryngitis in children. This has been called supraglottitis or epiglottitis. He has demonstrated that this is due to H. influenzae and is characterized by a markedly swollen epiglottis. The differentiation of this condition from subglottic laryngitis is important because H. influenzae is not affected by penicillin but must be treated with sulfonamides and streptomycin. This is particularly important since early recognition and early treatment will usually obviate the necessity of tracheotomy. It is often assumed that supraglottic edema is not so important as subglottic edema in causing an obstruction of the airway. However, one need not see many cases of supraglottic laryngitis due to H. influenzae to realize how serious they may be. One may surmise the possibility of such a diagnosis from the character of the respiration, but again the final diagnosis is only by direct examination of the larynx.

Included with the nonspecific inflammatory lesions that may produce acute laryngeal emergencies is bulbar poliomyelitis. Although poliomyelitis is a specific infection, the laryngeal emergency is not necessarily specific. There are two types of laryngeal emergencies that may occur with bulbar poliomyelitis. The first is where there is a bilateral abductor laryngeal paralysis with the resulting obstruction to the airway. It is obvious that this is an extreme emergency and tracheotomy is an immediate necessity. The other type is where there is a paralysis of either the muscles of deglutition or the muscles of respiration or both. Here the problem is the aspiration of pharyngeal secretions into the trachea and bronchi. In this type there is a puddling or pooling of secretion in the hypopharynx. With each inspiration these secretions are pulled into the larynx and trachea and even the bronchi, resulting in hypoxia, simulating drowning. In some of these cases posture and pharyngeal aspiration may be sufficient to maintain a clear airway. In other cases tracheotomy may be necessary to insure a clear airway and for aspiration of secretions. Particularly is this important when there is a paralysis of the phrenic nerve, intercostal muscles, or the abdominal muscles. In these cases, it is important because the loss of the power of the cough decreases the individual's ability to clear the airway.

One may argue that tracheotomy may also decrease the power of the cough reflex by eliminating its explosive potential. However, if some of the other factors have already been lost, the advantage of aspiration through the tracheal cannula is great. As we have observed and has been pointed out by others, changes in the pulse rate and blood pressure reading may give a good index of impending anoxia. Again if one waits until cyanosis develops, it may be too late to correct irreparable damage. Patients with bulbar poliomyelitis must have constant, careful observation to ascertain the approaching hypoxia. Any sign of increased restlessness, laryngeal stridor, change of blood pressure or increase in pulse rate may indicate that a tracheotomy is immediately necessary.

Tumors of the larynx may become a laryngeal emergency. Multiple papillomata are the commonest tumors that produce obstructive lesions in infants and children. Other tumors, large enough to produce obstruction to the airway, are rare. We still believe that papilloma of the larynx is best treated by local removal. Malignant tumors, fortunately, are rare in children.

Tumors of the esophagus may cause compression of the posterior wall of the larynx or upper trachea producing obstructive symptoms. We had one such case that died in spite of tracheotomy, the patient living approximately twelve hours after the tracheotomy without regaining consciousness.

Burns of the larynx may occur, being associated with burns of the pharynx and esophagus following the ingestion or aspiration of a chemical. This may produce either a temporary edema or the burn may be so severe that there is destruction of the mucosa resulting in a cicatricial stenosis. Where there is only a temporary edema the obstruction may subside rather rapidly. If there is loss of mucosa and a cicatricial stenosis develops, the treatment is usually more difficult. Dilatation through the laryngoscope may be necessary. In many cases an external operation may be necessary. Here the fibrous tissue must be excised and a split skin graft, wrapped around a mold of some sort, must be inserted to provide an epithelial lining for the larynx.

Trauma is an important etiologic agent in the production of laryngeal emergencies. This may be due to a lack of technic in insertion of the bronchoscope, too large a bronchoscope, or an unduly prolonged procedure. Also vegetable foreign bodies, notably, produce a chemical bron-

chitis and laryngitis. With any little manipulation in the larynx, an increase in the edema may occur resulting in an obstruction that may require tracheotomy.

Another source of trauma is an endotracheal tube for anesthesia. This may be due either to use of too large a tube or to the tube's being left in place too long. We have had a few cases that required tracheotomy twenty-four to thirty-six hours following operation.

Another important cause of traumatic laryngeal edema is the use of a feeding tube. The cricoid cartilage is pulled back against the spine by the cricopharyngeus, the lower portion of the inferior constrictor muscle of the pharynx. A feeding tube left in place too long may press upon the posterior surface of the cricoid and produce ulceration and edema. This danger can now be obviated by the use of the small plastic tubing which apparently produces no such reaction. The use of the term "feeding tube" should be understood to include tubes used for gastric and intestinal suction in abdominal or esophageal surgery.

The discussion of laryngeal emergencies would not be complete without mentioning foreign bodies. These may be ones that produce obstruction because of their size or they may be ones that produce a partial laryngeal obstruction and a spasm of the larynx. These usually constitute a group of extreme emergencies because the accident happens where there is no one who has the proper equipment or the training. Before anything can be done, asphyxia may have ensued.

The treatment, obviously is immediate removal of the foreign body. However, at times this may not be quickly or readily accomplished. In some of these cases a preliminary, temporary tracheotomy may be a life-saving procedure.

Esophageal foreign bodies or esophageal tumors may constitute a laryngeal emergency by compression of the posterior laryngeal or upper tracheal wall. Anyone who has performed esophagoscopies on children realizes the ease with which the posterior tracheal wall may be compressed. This coupled with a foreign body may produce even more dyspnea. This should be kept in mind when considering the advisability of using a general anesthetic in such cases. If a child is sufficiently obstructed so that it is using its accessory muscles of respiration to obtain sufficient oxygen, the use of a general anesthetic may cause respiratory arrest and death. Part of this danger may be overcome by the use of an endotracheal tube, but this at times may make the endoscopic procedure more difficult. Deep pentothal sodium® anesthesia should be used with extreme care in these cases, since not only may respiratory depression occur, but also spasm of the larynx may occur with this drug.

The role of allergy in laryngeal emergencies must not be overlooked. Angioneurotic edema may result in complete closure of the airway. In this regard, a word of caution should be given regarding the use of aerosol penicillin. We have seen a few cases of patients, sensitive to penicillin, who have developed angioneurotic edema of the mouth, pharynx or larynx. So far it has been recognized in time to obviate the necessity of tracheotomy. Nevertheless, this possibility should always be kept in mind if one is using penicillin mist.

The various etiologic causes of laryngeal emergencies in infants and children have been discussed, together with suggested treatment in some. It should be remembered that the younger the patient, the more of an emergency it is likely to be. One should never hesitate to inspect the larynx of a child directly. At the same time, anyone who is performing the direct examination should be ready to perform a tracheotomy immediately, since such an examination, in extreme cases may precipitate such a procedure.

HERPES LARYNGIS
HERPES ZOSTER OF THE VAGUS NERVE*

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Herpes zoster has been known since the days of Hippocrates; however only since the beginning of this century has herpes zoster been completely established as a definite disease, with specific etiologic and pathologic features. Despite the brilliant concept of herpes zoster of the cephalic extremity described by Ramsey Hunt[1] over forty years ago, herpetic involvement of the cranial nerve ganglia, other than the gasserian ganglion of the trigeminal nerve, is not well known. In recent years considerable interest[2] has been

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shown in herpes zoster of the seventh and eighth cranial nerves, herpes oticus, or the Ramsey Hunt syndrome. Herpes zoster of the glossopharyngeal and vagus nerves have long been recognized by laryngologists as herpes pharyngis and herpes laryngis. Herpes zoster of the upper cervical nerves, herpes occipito-collaris, is not too uncommon but frequently not diagnosed.

Judging from the very few cases reported in the literature, herpes zoster of the vagus nerve must be rare, but there is reason to believe that many cases have not been recognized. In view of the fact that virus diseases in general are apparently more prevalent and also because newer therapeutic measures offer some hope of specific treatment, attention is called to this interesting laryngeal disease.

At the present time, herpes zoster is thought to be caused by a varicella-like neurotrophic virus with a predilection for one or more of the posterior root spinal ganglia or the sensory ganglia of the cranial nerves. The acute inflammatory reaction in these ganglia results in a peripheral migration of the virus and a vesicular eruption in the peripheral cutaneous or mucous membrane distribution of the nerve affected. Clinically the zosterian eruption is preceded by prodromal malaise, slightly elevated temperature, and pain along the course of involved nerve. The process lasts from two to six weeks, and may be followed, especially in elderly patients, by a painful postherpetic neuritis of several months duration. In many cases there is a moderate increase in cells in the cerebrospinal fluid.

The vagus or tenth cranial nerve is composed of both sensory and motor fibers. The sensory fibers arise from cells in the jugular and nodosal ganglion which end in the medulla oblongata around cells of a nucleus which also contains the end sensory fibers of the glossopharyngeal nerve. Motor fibers arise from the cells of the nucleus ambiguus, also the somatic motor nucleus of the glossopharyngeal nerve. The parasympathetic efferent fibers of the vagus nerve arise from the dorsal nucleus and are preganglianis fibers to the thoracic and abdominal viscera.

The vagus nerve leaves the skull through the jugular foramen, accompanied by the spinal accessory and glossopharyngeal nerve. At this region the vagus nerve presents two ganglionic enlargements, the jugular ganglion and the ganglion nodosum. Both ganglia are similar in structure to the spinal ganglia and contain the cells of origin of the sensory fibers of the nerve; the motor fibers run past the ganglion cells (Spalteholz). From the jugular ganglion branches communicate with the accessory nerve, the petrous ganglion of the glossopharyngeal nerve, with the facial nerve and with the sympathetic by means of an ascending filament from the superior cervical ganglion. The ganglion nodosum is connected with the hypoglossal nerve, the spinal accessory nerve, the sympathetic, and first and second cervical nerves.

In the jugular fossa two branches of the vagus are given off, the meningeal and auricular. The latter, or nerve of Arnold, arises from the jugular ganglion and is soon joined by a filament from the petrous ganglion of the glossopharyngeal. It leaves the skull via the facial canal where it lies in contact with the facial nerve as far as the stylomastoid foramen. This nerve terminates in fibers which are distributed to the skin of the back of the auricle, the posterior region of the external auditory canal and the anterior-posterior external surface of the tympanic membrane.

The pharyngeal branch of the vagus is the principal motor nerve of the pharynx. It runs from the ganglion nodosum and joins with branches from the glossopharyngeal and sympathetic nerves to form the pharyngeal plexus. From the plexus, branches are distributed to the mucous membrane and muscles of the pharynx and the muscles of the soft palate except the tensor veli palatini.

The superior laryngeal nerve proceeds from the ganglion nodosum and receives a branch from the superior cervical ganglion of the sympathetic. It descends in the neck and divides into the external and internal branches. The external branch supplies the cricothyreoideus muscles and gives some sensory fibers to the mucous membrane of the larynx. The internal branch is distributed to the mucous membrane lining the cavity of the larynx to the vocal cords, epiglottis, the base of the tongue, aryepiglottic folds, and the pharyngeal mucous membrane behind the arytenoids. The recurrent laryngeal nerve is chiefly motor and is distributed to the remaining muscles of the larynx; a few fibers are given off to the mucous membrane of the lower part of the larynx and trachea. The remaining branches of the vagus, the cardiac, bronchial, esophageal, gastric, celiac and hepatic, are distributed to the thoracic and abdominal viscera.

Based on its anatomical distribution, the zoster zone of the vagus nerve has been described by Hunt as covering the arytenoid eminences, the aryepiglottic folds, the pyriform sinus, the epiglottis to midline, a wedge-shaped portion of the base of the tongue in front of the epiglottis and a portion of the soft palate. The zoster zone of the auricular branch consists of the posterior portion of the auricle and adjacent mastoid area, the posterior portion of the external auditory canal and posterior-inferior surface of the drum; the entire auricular area is the zoster zone of the fifth, seventh, ninth, tenth and upper cervical nerves.

The pain of vagal herpes zoster is confined to one side of the hypopharynx and larynx together with auricular pain on the same side. The pain is preceded by a prodromal period of elevated temperature, malaise, and severe dysphagia. Until the appearance of the vesicular eruption in the zoster zone of the tenth nerve the diagnosis is

uncertain. The slight localized inflammatory reaction and vesicle formation is soon followed after the rupture of the vesicles, by more obvious discrete shallow ulcerations. The ulcerations surrounded by angry red areolae, soon become confluent and covered with a grey membrane. There is some edema of the epiglottis, aryepiglottic fold, and arytenoid on the involved side. The aryepiglottic fold, the arytenoid eminence, and the epiglottis are the sites of predilection; the true or false cords are said to be rarely, if ever, involved. The wedge-shaped area at the base of the tongue is infrequently the site of the eruption.

Nausea and vomiting are a conspicuous feature; bradycardia and hiccough may be present. At the height of the illness the patient is an acutely uncomfortable person. The severe difficulty in swallowing, the extreme laryngeal and auricular pain, and the demonstration of unilateral herpetic lesions in the larynx are the diagnostic features of herpes laryngis.

Case Report.—Mr. E. G. P. was first seen on November 14, 1949, complaining of severe pain in the right side of his throat of three days duration. He stated that the sore throat was accompanied by great difficulty in swallowing and keen pain in his right ear. The illness started with chills, fever, and headache. The examination of the ear, nose, and throat was singularly negative except for an area of redness and several punctate ulcerations on the right arytenoid eminence. On his return to the office the following day the area of arytenoid redness was more intense and the ulcerated areas were larger and tending toward confluence. Because the pain had become unbearable at home and was accompanied by considerable nausea and vomiting, the patient was admitted to the Memorial Hospital on November 16, 1949. The general physical examination showed a well-preserved man of 69 years, with the following pertinent findings: slight weakness of the right arm (cerebral hemorrhage in 1948); slight left ventricular hypertrophy; blood pressure 160/100. Routine laboratory studies were negative.

His hospital course was characterized by considerable pain, especially referred to the right ear. The right auricle and scalp around the ear was sensitive to touch and the patient was afebrile while in the hospital. The herpetic lesion remained localized to the arytenoid and aryepiglottic area; the punctate lesions became confluent to form several larger ulcerations which became shallower and disappeared in ten days time. The vocal cords were normal in appearance and movement. The epiglottis, aryepiglottic folds, ventricular bands, true cords or arytenoid area on the opposite side remained unaffected. The treatment at first consisted of the control of pain and the use of penicillin. The patient showed no response to this form of therapy. On massive doses of thiamin chloride and vitamin B complex the patient apparently improved and was discharged on November 22, 1949.

COMMENT

There are many diseases characterized by pain and ulceration in the pharynx and larynx which can be confused with herpes laryngis and herpes pharyngis, unless the peculiar features of this condition are kept in mind. The pain in herpes is out of proportion to the size and nature of the area involved; the herpetic lesions are strictly unilateral; the vesicles rupture to form punctate areas of ulceration which later tend to become confluent; the duration of the infection is prolonged; the disease is accompanied by considerable nausea and vomiting.

It is said that because of the morphologic distribution of the motor fibers of the vagus nerve, which enter the nerve below the jugular ganglion, motor or laryngeal paralysis is rare. If present, the paralysis is temporary.

Due to the intricate intercommunicating overlapping network of the cranial nerves, and depending upon the degree and virulence of the infection, the clinical disease may present itself in a varied pattern. The infection can spread from one cranial ganglion to another and there may be involvement of several motor and sensory cranial nerves. The case here reported is similar to the case described by Bateman and Mayson,[3] and illustrates the rare laryngeal involvement of the tenth nerve in isolation. They say:

"The unilateral position of the ulcers on the epiglottis and aryepiglottic fold may be accounted as the post-vesicular stage of an acute posterior poliomyelitis of the inferior ganglion (nodosal) of the vagus, implicating the superior laryngeal nerve."

They also mention a case of otitic herpes with laryngeal herpes reported by MacKenzie in 1905.

In the case reported last year by Moffett and McFarland,[4] lesions both in the pharynx and larynx were noted, involving the left side of the soft palate, the pharyngeal wall, the epiglottis to the midline and the aryepiglottic fold. The characteristic symptoms and findings indicated a severe vagal herpes zoster in the distribution of the superior laryngeal branch with concomitant involvement of the glossopharyngeal vagal complex via the pharyngeal plexus. In the case reported by Wright[5] the herpes zoster was confined to the glossopharyngeal nerve.

The case splendidly described by Negus and Crabtree[6] presented a complicated involvement of the seventh, ninth, and tenth cranial nerves. In this case the involvement of the vagus was interesting. There was a herpetic eruption in the

right external auditory meatus and immediate surrounding area of the auricle, which indicated the implication of the auricular branch of the vagus. The pharyngeal branch of the vagus was involved with paralysis of the pharyngeal constrictors on the right side. The superior laryngeal branch showed its involvement by the presence of herpetic vesicles on the epiglottis and right aryepiglottic fold. The immobility of half of the palate in this case was attributed to paralysis of the levator palate which is supplied from the pharyngeal plexus from a union of the pharyngeal branch of the vagus with the glossopharyngeal nerve. The motor fibers in this network arise in the nucleus ambiguus and pass down in the vagus. Also the recurrent laryngeal nerve was affected with paralysis of the right vocal cord. Negus and Crabtree stated that the fibers to the intrinsic laryngeal muscles are derived from the motor nucleus of the spinal accessory which joins the vagus at the ganglion of the trunk (nodosal ganglion).

In the four cases of herpes zoster oticus reported by Engstrom and Wohlfart,[7] three were interpreted as vagoglossopharyngeal herpes zoster. In addition to cutaneous involvement of the auricular branches of the vagus and facial nerves there were mucous membrane lesions in the area of distribution of the vagus and glossopharyngeal nerves. Paralysis of pharyngeal and laryngeal muscles was present in three of the four cases and facial palsy in two. The eighth nerve was affected in all of the cases.

In the past there has been no specific treatment for herpes zoster. The literature contains many reports of success with a wide variety of therapeutic agents and methods. However, the recent reports on the use of the newer antibiotics, especially aureomycin[8] and chloramphenicol,[9] perhaps offer some promise, especially if they are given in the early stages of the infection. My experience with these drugs in a few cases of herpes zoster of the seventh nerve, has not been successful.

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HUMIDITY*

ITS RELATION TO PROBLEMS IN DERMATOLOGY

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In our attempts to determine the cause of many skin disorders, we commonly neglect properly to evaluate physical factors which offer a partial, and sometimes almost complete explanation for the phenomena observed. The skin is an extensive organ, whose weight in an adult approximates 7 to 9 pounds. This is approximately 1/16th or 6 per cent of the body weight.[1] The skin, therefore, is one of the larger body organs, and since it forms an external covering, it is exposed to physical changes in the environment, temperature and humidity being two of the more important factors. In an average adult weighing 63 kilograms (138.6 pounds), the body surface approximates 1.8 square meters (22.5 square feet). This exposed surface of the skin plays an important role in the maintenance of constant body temperature, and this is one of the physiologic functions which it accomplishes in the face of variable conditions.

In health the body temperature varies but little. Heat produced by metabolism usually exceeds that which is necessary to maintain normal temperature. Excess heat is lost by radiation, convection and evaporation from the body to its surrounding surfaces. Since air is the common medium in which we live, its temperature and moisture content, and its movement, are the factors which most concern us. Constant adaptation is a requirement for life, yet there is great variation in different persons under the same conditions. Our sensations to heat and cold are largely due to changes in skin temperature. These alterations, which occur on exposure, are determined by the cutaneous blood circulation, the rate of perspiration, and the extent of the wetted surfaces. The skin temperature, the rectal temperature, the heart rate and the rate of perspiration increase directly with temperature and relative humidity, and with the amount of clothing which is worn by the individual.[2]

Perhaps there is no more trite expression than

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to say, "It isn't the heat; it's the humidity," nevertheless, the importance of temperature and other physical factors to the comfort of the individual is so fundamental that it has shaped civilization in the past and continues to control our efficiency under varying environmental conditions. The expressions, "he is crazy with the heat" and "numb with cold," are so common that their origin is obscure. Both reflect the reaction of the individual to temperature extremes. It is only when we attempt to explain to the patient why an excessively cold, dry atmosphere makes his skin itch, or hot, humid weather causes discomfort and produces a miliariform eruption, that we become aware of some of our deficiencies in understanding such elementary banal disturbances.

Physiologic investigation has confirmed the well-known observation that an increase in humidity decreases the tolerance of a test subject for physical activity. Both high temperature and high humidity are less well borne with increased physical activity, while rest increases our comfort under these adverse conditions. Air movement is a third factor of prime importance to our sense of comfort. Though temperature and humidity remain constant, an increased air movement will lead to an increased loss of heat by evaporation of perspiration, and by convection of heat from the body surface. The amount of heat lost will depend upon the gradient between body temperature and the surrounding environmental temperature.

Evaporative heat loss is important in hot weather, especially as the temperature of air approaches that of the body, for at this point less heat is lost by convection, or radiation, and the cooling of the body is carried on largely by evaporative heat loss. The rate of evaporation is, therefore, of increasing importance in those climates in which the temperature soars into and above the eighties (80° F.). Now the rate of evaporation is directly dependent upon the humidity of the surrounding air. Humidity is a measure of the ability of the air to pick up moisture from a wetted surface. If the humidity is low, the cooling effect of dry air is great. If, however, the moisture content of the air is high, its cooling effect will be slight. It is important, therefore, in climates where the humidity tends to be above average, that air movement be maintained, since it is directly related to our comfort.

The relationship of physical factors to human physiology has been the subject of much fundamental investigation by physiologists, and by heating and ventilating engineers. Much of this work has been experimental in nature, and the few clinical studies which have been reported have not had the benefit of sound meteorology. It was decided, therefore, to investigate the relationship between the incidence of miliaria rubra and its causative physical factors from the standpoint of clinical records. Data regarding the incidence of miliaria rubra were obtained by reviewing the case records from the author's files. The average rate of occurrence of miliaria rubra in the Miami area was tabulated by month for a period extending from January, 1933 to September, 1950. This was weighted according to the mean monthly case load. The resulting distribution is shown in *Fig. 1*, in which it is compared with a similar distribution for four other common skin disorders. These findings confirmed an earlier impression concerning the increased frequency of certain common infections during the summer months, when the temperature and humidity are at their highest points. As might be expected, miliaria rubra shows the most clear-cut seasonal incidence. The term "prickly heat' is the most descriptive of our common names for any skin disorder. It is certainly related to temperature, and the sensation of discomfort is adequately described as "prickling." Impetigo and ecthyma are more common in warm climates, and even here they are more frequent during the summer months. In the same group, furunculosis and carbuncle were selected as a second disorder in which a bacterial agent is the immediate cause, while moniliasis and tinea versicolor were chosen as types for mycotic infections, because they are readily diagnosed clinically, and are subject to remission and exacerbation.

It is interesting to compare the incidence ratio of these diseases with a chart showing the mean monthly temperature, and the mean dew-point temperature in the Miami area (*Fig. 2*). While the more common method of referring to the moisture content of the air is to use the term "relative humidity," it is an undesirable method of expressing the humidity of a locality in the climatologic sense. Relative humidity can be defined as the ratio between vapor pressure of water vapor in a given sample of air to the vapor pressure that would exist if the air sample were completely saturated. Saturation vapor pressure varies rapidly with changes in temperature, and as a result the relative humidity commonly exhibits

a tremendous range in value during any twenty-four hour period. Dew-point temperature is the temperature at which condensation will occur if a given sample of air is cooled at constant pressure. It is subject to much smaller diurnal fluctuations than is relative humidity, and its mean value is, therefore, a good representation of the humidity of a locality. While the mean monthly temperature and dew-point temperature are elevated, the mean monthly wind-speed is decreased

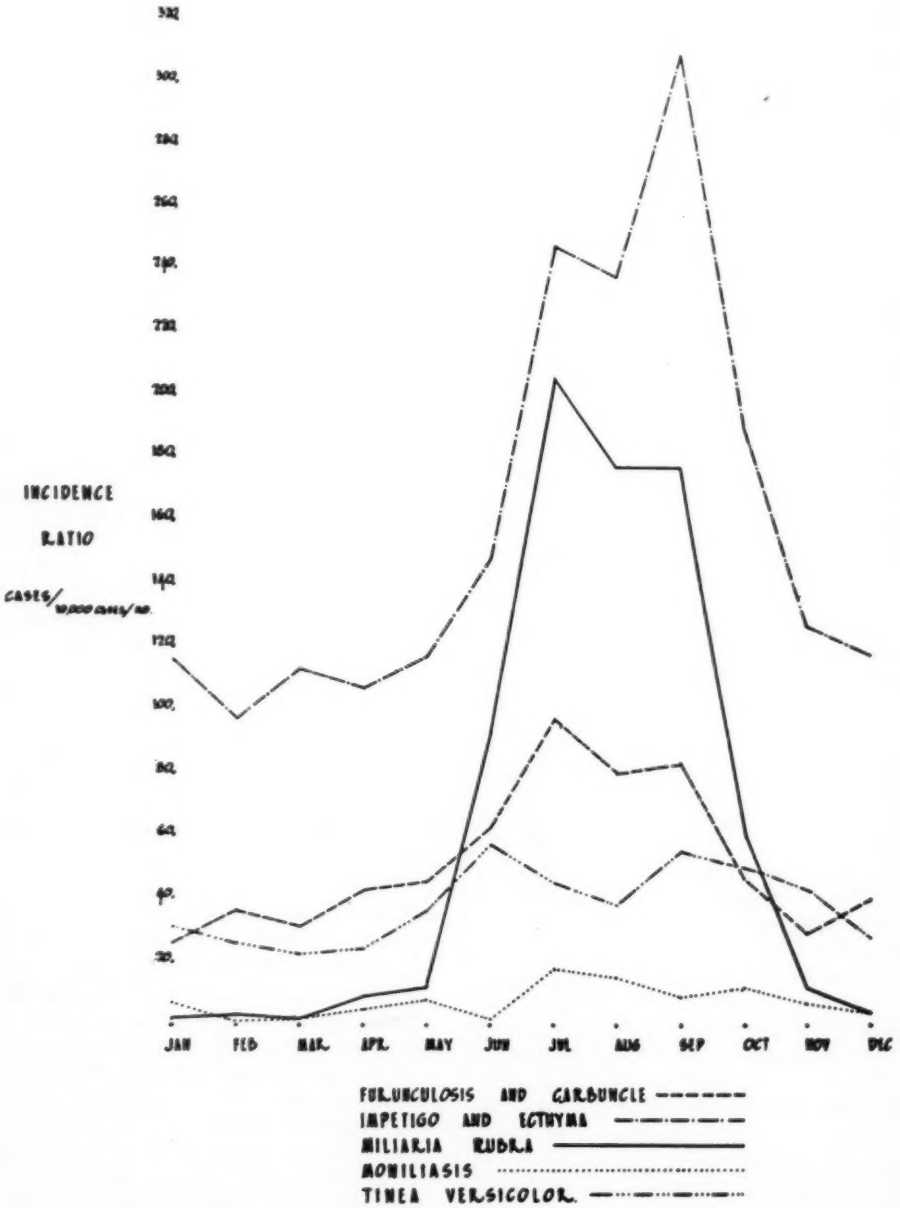

Fig. 1
Chart showing monthly incidence ratio of five common skin disorders recorded from the Miami area.

during a corresponding period. It is at once apparent that temperature and humidity are highest and air movement diminished in the months when these disorders are the most frequent.

Winslow and Herrington[3] have derived an expression for the convective exchange of heat between the human body and its environment, in which the mean turbulent wind-speed enters as the square root. These authors and others have proved that the active secretion of sweat is a direct function of the skin temperature, which is itself a function of the temperature of the en-

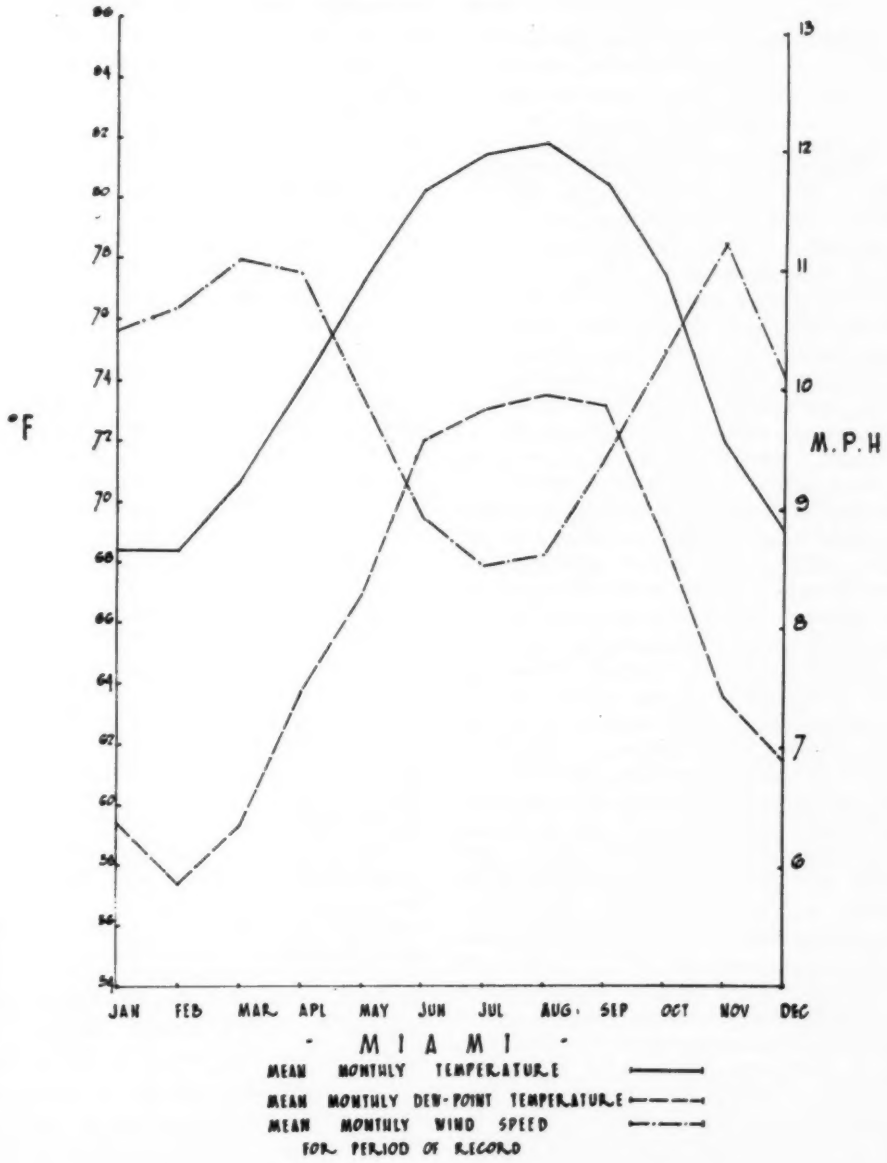

Fig. 2
Chart presenting climatological data during period of observation.

vironment. The following formula is proposed to show the relation of miliaria rubra to temperature, humidity and wind-speed:

$$I R_{m r} = 0.003491 \times e^{0.005381 \frac{(Td \times Ts)}{(\sqrt{V})}}$$

where

$I R_{m r}$ = incidence ratio of miliaria rubra in cases per 10,000 cases per month
Td = mean monthly temperature in Miami, °F.
Ts = mean monthly dew-point temperature in Miami, °F.
V = mean monthly wind-speed in Miami in miles per hour.
e = base of natural logarithms

This formula has been tested statistically and found to be highly significant, the correlation coefficient being 0.96.[4]

The climate in south Florida is classified as tropical savannah, or one in which a fairly well-defined rainy season alternates with a period of relatively dry weather.[5] The rainy season, beginning late in the spring, occurs through the summer months, while the drier parts of the year include predominantly the winter months. The mean monthly temperatures, however, do not vary greatly. Since this is true, we do not, and would not expect to find extreme variations in humidity which are long sustained. Perhaps there is a critical range of temperature and humidity which is necessary to produce, by cumulative effects, changes on the surface of the integument which are conducive to the occurrence of miliaria rubra and the associated common infections which accompany it. When we review the monthly incidence of miliaria rubra, and compare it with the mean average monthly temperature, we find a direct relation. A temperature in excess of 80° F. and a dew-point temperature which exceeds 70° F., or higher, obtains during the period when miliaria rubra is most common, and this is furthermore associated with a decrease in the mean monthly wind-speed, which averages nine miles per hour.

Changes in temperature and humidity between the summer and winter months in Florida are not great, yet they are evidently sufficient to affect the occurrence of these common disorders. These relatively small changes should be compared to the large fluctuations which occur in northern climates. Our patients are not exposed to artificial heat and the exceedingly dry atmosphere which exists for a greater part of the day in closed, heated buildings. We almost never observe in our clinical material bath pruritus and winter itch which are troublesome in the North, especially during the colder winter months. My records contain only seven cases of pruritus hiemalis (winter itch), all recent arrivals from a colder climate.

The original contributions of Robinson[6] and Pollitzer[7] have been substantiated and extended by the careful morphologic studies which O'Brien[8] has reported, and by the experimental studies of Sulzberger and his associates,[9] and by the work of Shelley.[10] Clinical observations and previous investigation will largely support the following account: when the mean monthly temperature exceeds 80° F. and the dew-point temperature 70° F., and such temperature and humidity is combined with low air movement over an extended period, the skin will gradually lose its ability to withstand the constant exposure to excessive perspiration. The oily protecting sebaceous film is gradually diminished, and perspiration no longer collects in beads at the openings of the sweat pores, but is absorbed into the horny protecting layer. The stratum corneum, due to hydration, becomes a better medium for the growth of bacteria and fungi. The growth of these organisms produces an inflammatory reaction which, together with swelling caused by absorbed perspiration, induces closure of the sweat pores. This is followed by retention of sweat and rupture of the superficial portion of the sweat ducts. A small vesicle forms at this point and is clear unless secondary infection ensues. If the pore closure is rapidly affected by acute inflammatory reaction, many superficial clear vesicles (miliaria crystallina) may be present. If, on the other hand, a low degree of inflammatory reaction is present, and sufficient time for growth of micro-organisms ensues, then an inflammatory reaction is present, and we have the typical clinical picture of miliaria rubra (prickly heat). This is, of course, the more common reaction. Where resistance of the skin to infection is sufficiently low, coccigenic infection may predominate and trauma may precipitate the spread of the infection to produce a bullous staphylococcic impetigo, or a superficial follicular infection (Bockhart's follicular impetigo), or a deeper infection of the hair follicle (furunculosis).

If the inflammatory reaction produced by the miliariform dermatitis is sufficiently severe and long continued, a disturbance of the sweating mechanism ensues (anhidrosis) which may persist for several weeks, and this loss of sweating func-

tion can be readily demonstrated. Anhidrotic asthenia, as a sequel to miliaria rubra and tropical anhidrosis, is observed infrequently in civilian practice. Though a starch-iodide test will demonstrate a disturbance of sweat function in those who have had an extensive miliariform dermatitis, our climatic factors are not sufficiently extreme to produce subjective symptoms in the majority of these patients.

While miliaria rubra is a disease of the eccrine sweat glands, with plugging of the pores, stagnation of sweat, inflammatory reaction, and sometimes secondary infection, the lack of involvement on palms and soles is paradoxical. Here we have the greatest concentration of eccrine sweat glands, yet miliariform dermatitis never occurs in these locations. Even the feet, which are ordinarily covered, and, therefore, subject to extreme conditions of temperature and humidity, do not develop miliaria. Certainly hydration of the stratum corneum, maceration and optimum conditions for bacterial and fungal growth do exist. Undoubtedly, anatomical and chemical conditions co-exist which here prevent the formation of miliariform dermatitis.

In contact patch testing with our current methods, the humidity factor must be considered. Miliariform dermatitis is to be differentiated from the reaction of contact, epidermal sensitivity. During the summer months, when temperature and humidity are high, this is a possible source of error. This is particularly true where occlusive dressings and adhesive tape are long in contact with the skin. This effect was produced experimentally by Shelley[10] and his associates, by macerating an area of the skin with wet dressings and subsequently exposing the individual to an atmosphere in which the temperature and humidity were sufficiently high to promote free sweating. We unwittingly reproduce this effect at times with patch tests and with occlusive dressings, but we should not unwittingly interpret the reaction as evidence of specific sensitivity.

The use of surgical dressings for minor wounds often defeats its own purpose. This is especially true in a warm and humid climate. These dressings absorb perspiration from the skin which is covered, and if evaporation does not take place, the crust, or dried exudate which forms a surgical barrier against infection, will become saturated with perspiration. This promotes infection by surface organisms, for we have constructed, in effect, a sweat poultice. Both fungous organisms and bacteria will flourish in areas which are so covered.[11] I have found it expedient for all minor lesions, especially on the exposed surfaces, to use no dressings whatsoever. In my experience, this saves not only time, but actually diminishes the number of days required for healing and the number of cases of secondary infection which result.

No discussion of humidity and its relation to skin disease can be complete without reference to clothing and shoes. We are all well aware of the effects and discomfort of rubber footwear, waterproof shoes and raincoats. Since they prevent evaporative heat loss, both the temperature and humidity in the layer of air in contact with the skin is elevated. Conditions are created which serve to promote recurrence and perpetuate the common fungous infections, especially on the feet. We have all observed exacerbations which occur after a hunting trip, or an unusual amount of walking, and we are familiar with the relatively low incidence of fungous infection in those who wear no foot gear a greater part of the time. To a less degree, the clothing we wear creates similar conditions which are favorable to growth of infectious organisms on the skin. In a warm and humid climate there is at the present time no fabric superior to cotton for underclothing and working clothes. Wool and linen, and the newer synthetics, are all inferior insofar as comfort is concerned.

Topical therapy of skin diseases is influenced by climatic conditions. The treatment of impetigo and ecthyma is no longer a difficult problem, with the use of our newer antibiotics. In former years, I found the commonly used mercurial ointments relatively ineffective and unsatisfactory because of humidity factors. The newer antibiotic preparations are not stable in aqueous solution, or one might achieve an even better result with their use on moist dressings and in lotions, on intertriginous surfaces. The sulfonamides were well suited to such application, but have been largely discontinued because of the relatively high index of contact sensitivity. Surgical dressings, and the use of adhesive tape, are more prone to disseminate than to retard the development of new lesions.

Our most troublesome problem is a seasonal one in which small, superficial, vesicular or bullous lesions develop in recurring crops, often on intertriginous surfaces. This is closely simulated by the infection due to monilia, and must be differentiated from Bockhart's follicular type of

impetigo. Here the lesions are not necessarily follicular, and the eruption has been described by Simons[12] as impetigo bullosa tropica, or pyosis mansoni. Individual lesions, of course, are readily cured, but recurrences are the rule rather than the exception, and control taxes the fortitude and ingenuity of both physician and patient. A drier climate, with a lower temperature, will effect more permanent cures with less effort than any other measure.

While discussing impetigo and its relation to humidity, pemphigus neonatorum should not escape consideration. I consider it a bullous type of impetigo, and since it occurs most frequently in newborn and premature infants, it may well be that the humidity-temperature factors are highly significant. The incubator, with its higher temperature and absence of air motion, must necessarily have a relatively high humidity. The ideal temperature, humidity and air motion for both nursery and incubator deserve consideration. Excessive clothing, especially of infants during the summer months, is a leading provocative factor in the production of impetigo, miliaria rubra and local skin infections.

Furunculosis, especially in children, shows a definite predilection for the summer months. It is a well-known fact that any cutaneous disturbance of inflammatory character may be followed by a series of furuncles, due no doubt to its lowered resistance to bacterial invasion. The occurrence of furuncles following an ordinarily severe contact dermatitis, needs no comment, and I feel that none will question the rather frequent role of miliaria rubra in the production of this follicular infection. The recent work by O'Brien[8b] supports this view. In children the head and face are sites of election, and this is probably due to a higher skin temperature in these areas, as contrasted to that of the extremities. Response of the existing lesions to treatment is satisfactory, but prevention of recurrence is an unsolved problem. In reviewing the literature, I find an author who offers my therapeutic advice for the treatment of these children. J. Boulnois,[13] a medical officer of Colonial Troops in Bengal, says:

> "There is a radical treatment, unfortunately too often impractical. It is rest in the mountains."

He makes this comment after reviewing all of the then current therapeutic efforts, and we can now add to them the sulfonamides, the antibiotics and all of the various local applications and general methods, and end with the same recommendation. For those who can afford a climatic change, no better remedy can be offered. It will be appreciated by the physician and pediatrician, whose therapeutic efforts have been defeated, by the mother who has labored with the local care for a series of furuncles, and by the father who cannot help but be affected by "warfare" in the house. Recurring furunculosis in a young child can be a difficult and stubborn therapeutic problem.

Acne during the summer months has certain features which are related to climatic conditions. There are several reports concerning the increased severity of cystic acne, and its increased incidence in tropical climates.[14 15] I find the average acneform eruption more difficult to treat and more difficult to control during the warmer summer months. Excessive perspiration and congestion of skin over the face and forehead contribute to overactivity of the oil glands; comedones form more quickly and become infected more readily.[16] I am not of the opinion that exposure to the sun is uniformly helpful in the treatment of acne. A sharp exposure, producing sufficient erythema to cause exfoliation, is an acceptable therapeutic measure. Excessive and chronic exposure, sufficient to produce deep pigmentation, will frequently lead to an acneform eruption which is most evident over the upper part of the back and shoulders, the extensors of the arms and occasionally the forehead and face. The explanation, I believe, is a mechanical one. In addition to formation of pigment, the stratum corneum becomes thicker to afford greater protection. This effects closure of some of the pores, while at the same time increased heat has led to increased sebaceous secretion. Retention leads to the formation of comedones, and these sebaceous plugs, acting as foreign bodies, produce an inflammatory reaction. Recovery is gradual over a period of weeks, and can be accelerated by cooler weather and the use of keratolytic preparations.

In discussing conditions which are the result of poral closure, hydrocystoma should not be overlooked. This condition is ordinarily asymptomatic, and I am convinced it is considerably more frequent than is indicated by the number of patients who consult a physician concerning these small, deep-seated cystic lesions. They are most commonly found over the forehead and nose, and show a definite seasonal tendency, occurring during the summer months, with increased humidity

and temperature, and regressing with cooler weather.

Intertrigo is a troublesome disturbance, not confined to hot climates, but certainly related to humidity, at least to the relatively high humidity which occurs in localized areas between opposing surfaces and beneath the clothing. If perspiration accumulates and cannot evaporate, it will lead to maceration and increased growth of bacterial and fungous organisms in the secretions which accumulate upon the skin. Yeast, cocci and mycelial fungi in various combinations are usually present. Obese individuals and fat infants are the common victims. Intertrigo presents a troublesome therapeutic problem. Complete rest, moist cold dressings and improved ventilation, afford rapid relief, but are frequently impractical. Every experienced clinician is aware of the fact that ointments are detrimental and not well borne on these intertriginous areas. Mild antiseptic applications and the use of absorbent powder and drying lotions afford much relief, but long continued use of such preparations may lead to accumulation of inert powder in the hair follicles, superficial vesicles and sweat pores, and produce a foreign body reaction. I have termed this condition "powder folliculitis." It occurs frequently on intertriginous surfaces. My favorite remedy is the use of 5 per cent resorcin in camphor water, when the reaction is quite acute, and to this is added 10 to 20 per cent alcohol after initial improvement has occurred. I have found such a preparation just as effective as the stronger, commonly used, but disagreeable Castellani's paint. Contact dermatitis from resorcin is not sufficiently frequent to invalidate its use.

Tinea versicolor is a chronic disorder which may be present for months or years, without causing trouble except during the summer months. At that time, excessive perspiration may lead to inflammatory reaction and widespread extension. The development of new, small, pinhead sized lesions at the opening of every sweat pore, produces a characteristic stippled effect before the lesions become confluent. No greatly increased incidence was noticed during the summer months. This is due no doubt to the large number of patients who consult their physician concerning the areas of apparent depigmentation which occur following sun exposure during our winter months.

No attempt was made to correlate the occurrence and exacerbation of dermatophytosis to climatic change. I do not doubt that it plays a dominant role, but the chronicity of the eruption, its persistence over a period of years, and the wide variety of its manifestations, make it difficult to analyze the cause for recurrence in many cases. We have, I feel, in the South more individuals with extensive dermatophytosis of the glabrous skin, and it is a source of great annoyance, especially to those who perspire freely during the summer months. Improvement from treatment can be obtained, but recurrence is frequent.

CONCLUSIONS

Clinical data are presented concerning the association of miliaria rubra and certain infections of the skin. A mean monthly temperature of 80° F. and a mean monthly dew-point temperature of 70° F., combined with a relatively low wind-speed (9 miles per hour), are conducive to the development of these common skin disorders, when such conditions exist for a period of two weeks or longer. The effects of such climatic conditions are cumulative, and they present special problems in the diagnosis and treatment of a number of skin diseases.

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FAILURES IN MEDICAL TREATMENT OF PEPTIC ULCER*

AN ANALYSIS OF INTRACTABILITY AS AN INDICATION FOR SURGERY

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In an attempt to clarify the problem of the refractory and treatment-resistant peptic ulcer there is a need for clear definition of terms, familiar through usage but often vague and subject to varying interpretations. At the outset an appreciation of the words, success and failure, is most difficult as they are applied to the end result of a prolonged daily regimen designed so to alter the environment of the ulcer that it may find no obstacle to healing. Often physician and patient cannot entirely agree upon the criteria and both wish for an impartial arbiter to confer the final decision. The radiologist, the endoscopist, and even the surgeon have been called to this judgment seat, but none have found it comfortable and all have seen their opinions and predictions confounded with the passage of time. Of necessity we have learned to accept a relatively short-term evaluation of results. The three-year or the five-year cure still furnishes the basis for most of our comparative statistics. The large number of practical therapeutic regimes and the natural reluctance of even the teacher of undergraduates to lay down fixed tenets of any standard therapy for peptic ulcer further complicates the professional evaluation of results. For the most part, however, we are necessarily concerned with the patient's own opinion. If he is convinced that all past efforts have resulted in failure, it will be most difficult to gain his cooperation in a new medical treatment program despite awareness of inadequacies of former regimes or deficiencies in adherence to them.

None of us seem to agree entirely on the application of the word, intractable, to the pain of peptic ulcer. In the broadest sense, intractability is a synonym for failure itself, but it is more commonly used to justify the treatment by placing the blame squarely upon the patient. Usually we try to divide the patients into those whose intractability results from medically unsurmountable anatomical or physiologic abnormalities, and those who have faulty and unchangeable personalities and habits of living. This is by no means a bad classification of ulcer patients, and it is not our purpose to criticize it, but to object to the growing impression that its establishment marks the end of the road as far as the internist is concerned. Much too often it is looked upon as the place where a changeover in medical direction is made. Here, especially in institutional practice, the patient's future welfare is too often consigned either to the surgeon or the psychiatrist. We cannot terminate our responsibility at this point or at any other until we understand and try to correct the separate and particular causes for intractability. What percentage of these causes is subject to objective evaluation and how many are still relative intangibles for one reason or another? There are enormous variations in the location and extent of tissue damage and changes due to reparative processes in the morphologic study of peptic ulcer. That some of these should create truly intractable situations in regard to spontaneous healing is not surprising. The surgical removal or by-passing of gross deformities usually becomes an essential means to an ultimately successful end-result. Unfortunately we do not always know when patients bear such lesions. Repeated x-ray studies may fail to reveal a deeply penetrating posterior wall ulcer or a walled-off perforation. Many clues can be obtained from an intelligent and cooperative patient which may lead to a correct clinical impression despite the failure of preoperative objective confirmation; but how often does the constitutionally inadequate or the psychopathic patient provide a sufficiently clear and trustworthy history for this purpose? In this connection a question must be asked of those who warn (with absolute truth) that serious psychic disturbances must be overcome before any sort of therapy can be successful.[1] What shall be done to control stubborn and refractory pain in such a patient when medical measures fail? Without regard for the understandable reluctance of all experienced surgeons to operate upon patients of this sort, and despite the frequently justifiable fears of psychiatrists that the trauma may be widespread and protracted, nevertheless such risks must sometimes be accepted and it is often the internist's duty to press for the decision with vigor. Fortunately such extreme problems are not commonly en-

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countered, but elements of the same doubts and fears arise in the consideration of any candidate for elective surgery in whom there is even a mild neurotic predisposition. They must not be allowed to influence the decision if there is reason to suspect that a definite anatomical obstacle to healing is present.

There is a well-known group in which the major cause for failure of the most thoroughgoing treatment program is not an apparently predestined mechanical one, but a combination of unfortunate circumstances either of personality or of situation. Most of these people are predictably rigid and inflexible in their emotional responses and their behavior patterns. They do not adapt themselves to changes in their environment, nor do they alter their standards for better or for worse to permit a degree of harmony in dealings with their associates. Both saints and sinners share this Darwinian deficiency and they equally frustrate efforts to achieve an effective medical treatment regime. Many of us, with an awareness of the shortness of our days, consign these patients to their own devices by one means or another. Some insist that the patients who will not discontinue smoking must go to another doctor, satisfied with the righteousness of their refusal to deal further with anyone who continues to use tobacco in the face of all elementary logic and common sense. If we are to permit ourselves to treat the sick with intransigient attitudes, why should we not also attempt to interdict every variant of the emotional norm which may threaten healing through inevitable physiologic responses? Many of these patients may have acquired their ulcer through exposure to just this sort of rigid demand in another aspect of their life experience. One cannot establish the rapport necessary for even an attempt at effective psychotherapy if the first step is the imposition of inflexible rules of conduct along with stern warnings of dire consequences if they are not accepted and followed perfectly.[2] Those who say psychotherapy is not the internist's business, or believe psychiatrists are able, by virtue of their adequate numbers and their breadth of medical knowledge, to assume the care of these patients, are almost certainly guilty of wishful thinking or self-deception. Until we learn to master some effective psychiatric methods, what shall be done for these patients when they experience truly uncontrollable pain? Frequently we are compelled to acquiesce if not to agree wholeheartedly in a projected surgical effort to improve if not to correct the situation. Environmental and economic circumstances, *per se*, never constitute valid reasons for the surgical treatment of peptic ulcer; but one is nevertheless sorely tried by the merchant seaman, the commercial fisherman, the aircraft pilot, and the many others whose situational restrictions render the detailed ulcer treatment program hopeless of accomplishment. Many of these people receive enormous benefit from a gastric resection and return to their necessary livelihood for years of pain-free productiveness. Undoubtedly the decision is a hard one, since it usually carries with it the unhappy necessity of persuading a reluctant surgeon to accept an admittedly maladjusted patient and assuring the psychiatrist that the project is, at very worst, a necessary adjunct to ultimately successful treatment of the fundamental emotional problem.

From these remarks one should not imagine that failure is to be admitted easily or prematurely. Indeed, it has long been standard practice to insist upon at least one period of intensive hospital treatment including full utilization of all available ancillary psychological and social service facilities before concluding that all resources of medical therapy have been properly utilized without success. Quite often we find it possible to control the previously intractable pain under these circumstances, but then our patient has been removed from the less fortunate group under present consideration.

In a recent review of all operations for peptic ulcer performed during the past twelve months in two of the larger general hospitals in Miami (excluding only the emergency closures of acute perforations) it has been of interest to note the percentage of those whose only reason for operation was intractable pain. *Chart 1* lists the indications for surgery in 68 patients and reveals that twenty (29.4 per cent) were operated upon for this cause. The fact that three in this group had experienced perforation and hemorrhage in

PRIMARY REASON FOR OPERATION, 68 PATIENTS

Perforation (chronic with abscess), 5 patients, 7.3 per cent	
Hemorrhage (acute and chronic or recurrent), 11 patients, 16.3 per cent	
Gastric ulcer with suspicion of possible carcinoma (failure to heal within maximum "safe" period), 13 patients, 19.1 per cent	
Cicatricial pyloric obstruction (with persistent and severe gastric retention), 19 patients, 27.9 per cent	
Intractable pain (unrelieved by protracted medical therapy), 20 patients, 29.4 per cent	

Chart 1

the remote past may have influenced the decision in those patients to some extent. A similar survey of indications for surgery in the treatment of peptic ulcer made at the Minneapolis General Hospital revealed that 20 per cent of those operated upon from 1940 to 1947 were so treated because of intractable pain alone, although 90 per cent had pain which failed to yield to medical treatment in addition to one or more of the usual complications.[3]

Further analysis of the twenty cases operated upon because of intractable pain alone, (*Chart 2*) reveals that ten were patients in the Coral Gables Veterans Administration Hospital, only three of whom had clearly service-connected disabilities. The remainder were treated in this institution, ostensibly at least, because they lacked the means to pay for private care. Of the ten who were hospitalized at the Jackson Memorial Hospital operated by Dade County, only three were medically indigent while seven payed for their hospital and professional services. This apparent discrepancy is, of course, explained by the nature of the requirements for admission to our government hospitals, and the over-all impression would discount the importance of purely economic factors as major causes for intractability. On direct questioning only three out of twenty actually denied economic and financial problems of importance. This percentage would probably be about the same in any survey of healthy productive people.

It is to be expected that some effort should be made to identify and correct psychiatric and situational abnormalities in such patients prior to the final decision to request surgical assistance. *Chart 3* indicates the gross classification of the twenty patients in this group. Only seven were seen by a qualified psychiatrist in formal consultation, and only three remained under psychiatric treatment after preliminary diagnosis was made. The remaining thirteen received their psychiatric classification insofar as this was possible from the physician in charge who was usually a general practitioner or internist. Many of these appeared to be altogether average-normal in personality integration, but all were at least temporarily hyperkinetic and over-aggressive toward their environmental situation. Among these was the charter-boat fishing guide, dependent for his livelihood upon unpredictable vagaries of the weather, changeable feeding habits of the fish, and innumerable whims of his clients. When asked to sell his boat and try to earn a living some other way, he said, "I've tried 'em all and this is best but it's sure a sorry life." Nothing constructive emerged from the philosophical discussion that followed except, possibly, the decision to proceed with a gastric resection. It is difficult to escape the realization that we have failed many in this group by our inability to provide access to trained psychiatrists for specialized treatment.

A group of miscellaneous factors subject to reasonably exact study and others impossible to evaluate objectively make up the broad subject of the medical treatment regime. It is quite likely that much of the true explanation for many cases of intractability could be found in the data which appear on *Chart 4*. If the small group under present study is at all representative, the dura-

ANALYSIS OF INTRACTABLE PAIN, 20 PATIENTS

1. Economic Factors

Jackson Memorial Hospital, 7 private (full-pay) patients
3 medically indigent patients

Coral Gables U. S. Veterans Administration Hospital
3 service-connected patients
7 medically indigent patients

(Only three patients denied all economic and financial worry)

Chart 2

ANALYSIS OF INTRACTABLE PAIN, 20 PATIENTS

2. Situational and Personality Factors

Mild to moderate psychoses, 3 patients (both diagnosis and continuing treatment by qualified psychiatrist)

Moderate to severe neuroses, 4 patients (diagnosis only by qualified psychiatrist, based upon one or two interviews)

Mild neuroses of all types, 6 patients, no psychiatric aid

No demonstrable abnormality of personality, 7 patients, no psychiatric aid

Chart 3

ANALYSIS OF INTRACTABLE PAIN, 20 PATIENTS

3. Medical Treatment Factors

(1) Age of patients: youngest 25 years, oldest 56 years, and average 41 years

(2) Duration of symptoms: minimum 15 months, maximum 29 years, average 11 years

(3) Physician's evaluation of medical treatment prior to decision for operation: good (intensive, hospital) 16; fair (standard, ambulatory) 3; and poor (substandard) 1

(4) Patient's own evaluation of his cooperation with the prescribed medical treatment: good 6, fair 10, and poor 4

(5) After forceful interdiction of tobacco in all forms: stopped altogether 6, "cut down" (?) 3, and continued to smoke 11

(6) Control of gastric hypersecretion and hyperacidity: ineffective 5, and not evaluated 15

Chart 4

tion of symptoms appears rather long for such young patients. Item 3, while difficult enough of ready acceptance because of the personal nature of the classification, is still less meaningful because of the patient's own statements, item 4, regarding the degree of cooperation given to the program prescribed for them. Those who are certain of the deleterious effects of tobacco perhaps need no other explanation than item 5. The important factor of adequate 24-hour acid neutralization could be evaluated only by implication in this group. With the exception of a few of the hospital-treated patients, none received the careful measurement and titration of 24-hour gastric secretion essential to a realistic evaluation of medical therapy. If we add to these obvious examples of treatment deficiencies, those vital intangibles such as the ideal physician-patient relationship, we cannot doubt that a small number of these patients were given up as hopeless before a well-planned and diligently implemented medical attack was ever made.

The incidence of undiscovered complications as causes for intractability has been the subject of much speculation.[4 5 6] One must not quickly discard a strong suspicion of some anatomical reason for the failure of medical therapy. The limits of radiologic surveys have not yet been reached, and we are indebted to the roentgenologists who have extended the range of possibility to the point where 90 per cent or more of the anatomical complications of peptic ulcer can be demonstrated on an x-ray film. Some lesions defy objective delineation, however, in spite of the most painstaking technic and the highest degree of skill. Many of these are posterior wall gastric and duodenal ulcers which have created sufficient inflammatory reaction in the pancreas, bile ducts, or other adjacent structures to result in small walled-off abscesses or simply dense adhesions sufficient to prevent restoration of normal motility and, perhaps, blood supply adequate for healing. In *Chart 5* the preoperative clinical impression, gained almost entirely by the history alone, is of interest when compared to the actual surgical findings. In only two instances was the preoperative suspicion of a morphologic reason for failure of medical treatment unsupported by the surgeon's findings. Distinct anatomical alterations sufficient to preclude healing were found in eight cases, however, where the preoperative impression favored a situational or faulty behavior etiology for medical failure. Four cases suspected of having anatomical obstacles to healing were confirmed as such, and six who were labelled purely situational or neurogenic were found to have no significant morphologic changes at surgery. The preoperative clinical impression was affirmed by the surgical findings in only half of the group, with the major error obviously consisting of too low a suspicion index for undiscovered complications.

Before attempting to suggest that analysis of this small group has taught us that over half the patients labelled intractable are really victims of complications comparable to those who bleed, perforate, or obstruct, the surgical and pathologic reports must be examined very carefully. Can we really determine what constitutes an anatomical obstacle to healing? In *Chart 6* the abnormality is described as it was seen by the surgeon. The extent of involvement of adjacent structures was sufficient in over half of the twelve patients to prevent the safe accomplishment of one of the standard subtotal resection operations, and some type of exclusion resection was resorted to out of necessity. In two cases an unsuspected severe

ANALYSIS OF INTRACTABLE PAIN, 20 PATIENTS

4 (a) Anatomical Complications; Correlation of Preoperatively Unconfirmed Clinical Suspicion with Actual Findings at Operation

Group 1: 6 patients suspected preoperatively of some anatomical complication: confirmed at operation 4; not confirmed 2

Group 2: 14 patients in whom no suspicion of anatomical complication existed preoperatively: confirmed at operation 6; not confirmed 8

Only 50 per cent of preoperative clinical impressions regarding presence or absence of anatomical complications were confirmed at operation

Chart 5

ANALYSIS OF INTRACTABLE PAIN, 20 PATIENTS

4 (b) Anatomical Complications, Not Demonstrable Preoperatively, as Described at Operation

Posterior wall gastric (stoma) ulcer with gastro-jejuno-colic adhesions, 1

12 patients with significant anatomical abnormalities, 60 per cent of total group

Severe antral gastritis with extreme transpyloric prolapse of mucosa, 2

Posterior wall duodenal ulcer with deep penetration into pancreas, 3

Posterior wall duodenal ulcer with dense adhesions to adjacent viscera, 6
(Six standard subtotal gastric resections and six exclusion type resections were done in this group)

8 patients without significant anatomical abnormalities, 40 per cent of total group

No significant anatomical findings except for minimal scarring of an otherwise normal duodenal bulb, 8
(Five standard subtotal gastric resections and three posterior gastro-enterostomies with vagotomies were done in this group)

Chart 6

antral gastritis appeared to be the major factor in the creation of intractable pain. Preoperative gastroscopy, unfortunately, had not been requested in either of these patients. It seems quite reasonable to believe that lesions of the sort described might well prove resistant to medical therapy indefinitely, and without regard to the personality or situation of the patients and their many doctors.

In the eight patients remaining in the intractable group, the surgeon could find no gross departures from normal. The usual description was induration or scarring in a freely mobile and reasonably normal duodenal bulb. A gastric resection was done in five of these cases largely because it had been requested by the patient and his physician, and because the surgeon had no strong convictions which might have served as a deterrent. In three patients with no evidence of stenosis or extension and involvement of adjacent structures, a posterior gastro-enterostomy and vagotomy was wisely chosen as the most suitable corrective measure. These patients have been free from both hydrochloric acid and ulcer-pain for over a year since the operation. The extent to which these decisions regarding optimum treatment were justified cannot be determined until after the passage of many years. All are free of pain and rehabilitated to the extent of productive self-support at present. None have suffered from obvious psychic exacerbations since the operation, but insufficient time has elapsed to permit even tentative evaluation of this portion of their illness.

Attempts to classify patients in these two divisions of the intractable pain group by means of estimates of emotional stability and personality integration lead to a total absence of correlation. Patients with neurotic and mildly psychotic behavior patterns appear in both the complicated and the apparently uncomplicated divisions, and in about the same proportion. Alcoholics, narcotic addicts, and hysterical patients occur in both groups. No single clue was offered by behavior and personality studies which might serve to distinguish those with anatomical complications from the others. Many false impressions, however, were derived from attempts of this sort and these account for most of the errors in *Chart 5*. The three patients who were treated by gastro-enterostomy and vagotomy were recognized preoperatively as uncontrolled hyper-secretors, and thus fulfill Palmer, Kirsner, and Levin's[7] requirement for the application of the term "intractable," as do the twelve with anatomical complications. This leaves five patients, one-fourth of the group, who may well have been so labelled incorrectly and for whom the decision to perform a gastric resection may have been a serious mistake. It is important to remember, however, that the five patients about whom this doubt is now expressed could not be differentiated from the remainder of the group preoperatively.

CONCLUSIONS

(1) Medical treatment in this group was not entirely satisfactory in many instances.

(2) Defects were partly due to a failure of the physician to take a firm attitude and insist upon measures to evaluate the effectiveness of his treatment efforts, such as analysis of volume and acidity of various phases of gastric secretion at least once or twice in the course of the intensive medical regime.

(3) Part of the blame inevitably rests upon the patients who were either unable or unwilling to assume a fair share of the responsibility by intelligent cooperation.

(4) Evaluation of the patient's inability to cooperate reveals a high incidence of both psychotic and seriously neurotic persons in this group. Insufficient help has been obtained from qualified psychiatrists in the attempt to manage these difficult patients. The blame must be shared by both the internist and the psychiatrist.

(5) A high incidence of suspicion must be maintained for hidden anatomical complications in this group since 60 per cent of those reported here showed such lesions at operation.

(6) When the diagnosis of intractability has been made, a serious effort to explain it at least on theoretical grounds should be made in each individual case before surgical assistance is requested.

(7) In view of the high incidence of anatomical complications a standard or modified subtotal gastric resection is the procedure most likely to give prolonged freedom from pain and to restore a normal productive life to the patient.

(8) When no anatomical factors appear to exist at operation, there is still much logic in deciding upon a posterior gastro-enterostomy and vagotomy, especially in young patients with relatively short duration of symptoms.

(9) Intractability should not continue to be a wastebasket catch-all and an excuse for backing

reluctantly into the operating room, but a comprehensively analyzed complication of peptic ulcer which receives the same thoughtful and skillful surgical treatment required by pyloric obstruction, acute and chronic perforation, and serious hemorrhage.

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MEDICAL EDUCATION IN TIME OF NATIONAL EMERGENCY*

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INTRODUCTION

Altogether too few who read the current newspaper releases of the low mortality rates encountered among those of our combat men wounded in the Korean conflict are able to visualize the foundation of scientific endeavors which have made such results possible, and altogether too often such statistics are taken for granted and medical care of this high caliber is envisioned as self propagating and more or less automatic. Such an outlook comprehends the visible foliage, branches and trunk of the tree of medical science but does not appreciate the invisible roots of medical education essential to the growth and stability of the whole. To say that without its roots a tree will not survive is certainly an obvious and yet none the less fundamental fact which must be reasserted in the interests of medical education during these days of crisis.

We cannot live in our present environment of mounting international tension without realizing the seriousness of the world situation, and though we cannot estimate with any degree of accuracy the duration of the emergency, it would appear that serious times lie ahead and our nation may well be fighting desperately for survival in the not too distant future. That such a course of events will result in measures of strict economy all through the warp and woof of our national structure is to be expected and yet in the light of the technics of modern warfare, both offensive and defensive, this country would be short sighted indeed even to the point of inviting defeat did she not protect her lifeline of medical education. While adjustments and educational "belt tightening" must be expected we cannot serve the best interests of the nation in long range planning if we sacrifice quality of medical education for speed and quantity.

Dr. Robert Moore, Dean of Washington University School of Medicine, aptly said during an open session of the Committee on Planning for National Emergency at the 1950 Lake Placid Meeting of the Association of American Medical Colleges, that West Point and Annapolis are no more important during a National War Emergency than are our schools of medicine. Leaders would do well to keep this thought in mind as they consider manpower needs in the light of the necessity for an uninterrupted chain of students through college, medical school and graduate hospital training.

It might be well at this point to comment on the boundaries of medical education both as to the length and breadth in so far as these are related to the present national emergency. Technically it may be difficult to ascertain just where medical training commences and where it terminates, but rather than lose ourselves in a maze of academic debate let us concede that a matter of practical importance confronting us is the availability of adequate numbers of qualified applicants trained in the liberal arts and sciences. Secondly, and no less important, is the essentiality of continuing graduate or residency training.

The breadth of medical education presents many facets some of which are not understood fully even by the scientific educators. Surely the training of anatomists, physiologists or biochemists must be given serious thought in the over-all economy of a school of medicine. For example, the present supply of young anatomists is alarmingly low due to a short sighted deferment policy during the past World War. We cannot afford to repeat this mistake in the present emergency without suffering serious consequences.

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It is important that we as medical educators make a serious appraisal of our responsibilities to the over-all interests of our nation. These responsibilities include the need for an honest and realistic approach to the problem of military manpower shortage and yet at the same time it is essential that a constant watch be maintained in the field of medical education lest quality be compromised. It would be unfortunate indeed were a competitive rivalry to develop between the armed services and civilian medicine in the procurement of men, for in the final analysis in the next world conflict there will not be the distinct line of demarcation between the military and civilian population which has existed in the past, either in relation to participation in the war effort or in casualty rates.

THE SUPPLY OF PREPROFESSIONAL STUDENTS

There are many problems facing the development of a practical and satisfactory procedure for the deferment of preprofessional college students. Certain of these problems must be solved by the college administrators and others by the schools of medicine. The mechanics for deferment are supplied at present by Selective Service local board memorandum number seven. However, a broader plan based on the standing of students in the freshman and subsequent years of college and a scholastic aptitude test administered by a nationally recognized testing service, such as the Educational Testing Service of Princeton, New Jersey, has been recommended to General Hershey by the five scientific advisory committees to the Selective Service System. This broader plan has the endorsement of the Joint Committee on Medical Education in Time of National Emergency, representing the Association of American Medical Colleges and the American Medical Association.

Care must be exercised in the correct interpretation of deferment plans based on intellectual ability alone for there is room for serious criticism of such a procedure in relation to the question of democratic principles. There are certain fundamental dangers inherent in the decision that a college student with a "C" average must carry a gun as an enlisted man, whereas his classmate with a "B" average is to be deferred for professional training and an ultimate commission as an officer. This question is raised not as evidence that the student's academic standing should not be one of the criteria for admission but rather to caution lest this impersonal yardstick be misunderstood by some and abused by others, thus resulting in the whole system's falling into disrepute. The public must realize that this is a primary step in selection.

As a crude analogy let us consider the fact that an infantry soldier must have two intact and well functioning upper extremities before he can be considered eligible for combat duty. However, this in itself does not mean necessarily that he will be a good soldier or that he will not drop his rifle and run when he hears the first shot fired in anger. Obviously further selection is necessary. Similarly modern warfare with all of its technical developments presents a great demand for skilled scientific personnel and the basic requisites for such candidates are intact and well functioning intellects. Just as in the case of the infantryman the possession of such basic essential faculties does not insure a successful finished product a few years later.

Once a pool of candidates selected by the above standards has been established then it is essential that the final choice of medical students rest in the hands of the medical schools themselves. It is at this stage that the admissions committees must determine whether the applicant possesses those qualities beyond a basic intellectual aptitude which should favor a successful professional future.

The provisional acceptance of college students for professional schools early in their college careers is a questionable policy and may result in further administrative problems in undergraduate education. It is difficult for a college instructor to be objective at all times in the establishing of grades in the face of external and internal pressures when he realizes that his actions may precipitate the drafting of a student and the termination of ambitions for a professional career. Most of us have graded enough papers to realize that in good conscience a five per cent shift in either direction is not too difficult a procedure. It may not be fair to the college instructor nor his student for a school of medicine to extend provisional acceptance down to the freshman or sophomore years.

There is a tendency on the part of college students under the stress of possible military call to shorten their period of preprofessional training to the bare minimum so as to gain the comparative safety of medical school at as early a date as possible. This state of affairs is encouraged to a degree by the pressure of those in

authority who feel that they would gain a year or more of service from these students. One might debate the advantages of a four- over a three-year program of preparation but certainly the reduction of this undergraduate training to a minimum of ninety semester hours or three academic years of college credits should not be exceeded. Herein lies the careful consideration of the possible compromising of quality of medical training for speed and quantity.

Should members of the Armed Forces desire entry into schools of medicine the quantitative and qualitative requirements should be comparable to those of civilian applicants with the selective decision remaining in the hands of the admissions committees. Certain shortages of physicians in the military branches might be obviated were the Armed Forces to establish a definite long range policy in regard to undergraduate medical education such as has been developed to a high level since World War II in the military residency training program. The schools of medicine cooperating in such an educational venture would of necessity establish quotas dependent on realistic military needs, to the solution of which problem the parent Association of American Medical Colleges might well contribute.

THE MEDICAL STUDENTS

The Selective Service System has provided a mechanism for the deferment of medical students as outlined in local board memorandum number seven. This system proved satisfactory during the past World War and there is no reason to doubt that it will function well during future national emergencies.

Not so simple is the answer to the question of the degree of obligation of deferred medical students to serve their country on completion of their professional education. Closely allied to this problem is that of governmental subsidization of medical students. One has but to appreciate the recent misunderstandings as to obligation which developed as a result of the A.S.T. and V-12 programs to realize that definite understandings must be established to cover this situation in the future.

First, in approaching the more concrete financial problem it must be realized that to subsidize medical students with governmental scholarships carrying service clauses is but to invite further problems relative to obligations. A dangerous cycle is stimulated by selecting an outstanding student, granting him a federal scholarship and then penalizing him by demanding of him a longer period of service to the government. A far better solution to this problem is one of federal loans available to any professional student in good standing at a low rate of interest, payable over an extended period of time and with a cancellation clause to cover death or total disability. Such a contract, like that which the National Life Insurance issued members of the Armed Forces during the last war, carries no obligation problems and yet accomplishes the purpose of aiding those who are in financial need. It would be unfortunate were the financially embarrassed student forced to assume greater service obligations to his country than his financially more fortunate fellow student. We remember with a degree of shame the Civil War indentures whereby the wealthy might substitute money for military service.

Should a medical student desire a professional future in the government or desire to utilize the service method of balancing an educational debt, then there should be available commissions in the medical branches of the federal departments. Certainly this not only is a more democratic method but also it should result in a steady supply of professional men who have deliberately chosen a military or public health career.

Turning next to the obligation of medical students as a result of their deferment from induction in order to pursue a professional education, it is extremely important that this matter be defined clearly now in order to prevent later confusion. It would seem that the simplest and most practical solution already has been offered by the passage of public law 779, which in effect extends the age covered by the Selective Service Act within certain health professional categories. Thus graduates of medical schools will automatically be liable for military service as long as they fall within proper age and service stipulations. Certain points in the application of this law need further clarification, for example; the question of liability for service and the service rendered being limited to periods of national emergency only. One can visualize the growth of certain abuses unless specific definitions are established.

The doctor draft law has been criticized because of its implied discrimination against a professional category. It would seem in view of the nearly total participation which will be re-

quired of the population in any future wars that all professional and scientific men and women, whether they be members of the health professions, engineers or chemists, fall within a draft law comparable to public law 779. Advisory councils to the selective service system from the national to the state and local levels have been established to referee the drafting of doctors and a similar representative body might adjudicate the problems of the essentiality and availability of the over-all scientific personnel.

To recapitulate, on the basis of past experience, it would appear unwise to place all medical students in uniform or to have them subsidized on the basis of future federal service obligations, but rather a better policy would be to utilize the mechanics of a system similar to public law 779 to solve the debt of deferment and to extend a long term, low interest educational loan without service obligations to aid those students under financial stress. At the same time opportunities in the way of commissions should be available to those either desiring a federal career or wishing to use the service system as a solution to their educational debt; however, the obligatory clauses in this last group must be clearly defined.

THE MEDICAL SCHOOL FACULTY

The minimal faculty requirements for the seventy-nine schools of medicine in the United States are not uniform inasmuch as there exist many modifying variables not the least of which is the extent of participation in research programs. Good teaching engenders good research; however, medical educators must not lose sight of the fact that the primary function of the school of medicine is to train doctors of medicine. Should the research demands in time and personnel jeopardize the teaching of medicine then we are in the paradoxical situation of having the tail shake the dog. In the other extreme an institution of undergraduate medical education which does not foster healthy research is decadent.

Faculties in schools of medicine carry a variable degree of teaching loads outside their responsibilities to students of medicine, thus their educational efforts are expanded to cover the instruction of students in nursing, dentistry, pharmacy, medical technology and the basic medical sciences. Furthermore the faculty is engaged in the instruction of residents and interns. The proportions of these more or less extracurricular activities are a further variable contributing to the lack of uniformity in the faculty-student ratio in American medical schools.

In the light of the variability in numerical faculty strength there is a danger in establishing a definite faculty-student ratio to be utilized as a standard in periods of national emergency. In order to determine certain minimal standards, ratios have been discussed by medical educators with the conclusion that at least one full time faculty member or an equivalent number of part time teachers are necessary for every four students in each of the first and second years and one full time faculty member or equivalent number of part time teachers for every three students for each of the clinical third and fourth years of medical school. However, it is conceivable that a numerical ratio which might be adequate for one institution could cause serious curtailment in another. In discussing the establishing of standards one is reminded of the cartoon portraying Mike, whip in hand and straining forward in the driver's seat of his buggy, frantically urging his horse in an effort to approach the fifteen mile per hour limit through a speed restricted section of town.

The safer and more equitable procedure in the determination of minimal faculty requirements is to establish a base line for normal times and then utilize a percentage reduction from this level. Before accepting a decrease in faculty numbers as a necessary step in the over-all emergency economy, careful consideration should be given the urgent requests that schools of medicine increase their student enrollment. In fact many institutions, in order to conduct essential research and maintain a high quality of medical education may well require additional staff.

There exists a grave danger in the limited supply of faculty in the basic science departments. This is not a situation precipitated by the present emergency but rather is a condition which has existed for some years and one which will become critical unless definite steps of correction are established. The *Anatomical Record* of September, 1950, published a list of members which medical educators cannot read without alarm. In this listing there are approximately twice as many professors as associate professors and three times as many professors as assistant professors. Whereas probably not all anatomy instructors are members of the Association of American Anatomists something certainly is amiss when the ratio of listed professors to instructors is approximately twenty to one!

Two factors have contributed to this shortage: first, the unequal competition by industry which afforded much greater economical security outside the walls of medical schools, and secondly, the short sighted deferment policy of the past World War. Certainly a realistic appraisal of graduate students in the basic science departments, whether they are engaged in essential research or not, is of critical importance if a steady supply of medical educators is to be maintained through the coming years.

From the standpoint of efficiency alone careful thought should be given the necessity of uprooting a scientist from facilities and an environment with which he is familiar and assigning him research problems elsewhere. Might it not be far more economical and productive to leave this faculty member at the school of medicine where he can attempt the solution of the scientific equation and at the same time aid, though only in part, in the educational program?

THE MEDICAL SCHOOL CURRICULUM

Though a fundamental uniformity exists in the curriculums of schools of medicine in the United States there is a wide variety of modifications both in the basic and clinical years. Such a variety is essential to progress in medical education and it would be dangerous to attempt conformity to a standard curriculum in the hope of developing speed in the manner of an assembly line production.

Medical schools should establish "catastrophe" training not only during periods of national emergency but also there should be included in the permanent curriculum instruction relative to civilian emergency relief in the event of disaster, whether this be as a result of earthquake, flood or atomic attack. If there exists a dearth of faculty informed in this field, much of the material can be covered by the Professor of Military Science and Tactics in conjunction with the R.O.T.C. program. Excellent audiovisual aids are available now to present current views on atomic defense and radiation protection. Furthermore there is no reason why medical students in their final two clinical years should not participate in organized municipal and state plans for civilian disaster relief.

The accelerated program utilized in World War II by schools of medicine is mentioned here for strong condemnation. The result of this sacrifice of quality for quantity has become evident during the years since the war. The effects of the constant pressure of intensive study on the students needs no further discussion but a point of as great or even greater significance is the faculty reaction to such measures. A tired instructor who passes from one course to another without the stimulation of the change of mental environment falls into a treadmill system with results in keeping with such a situation.

The twelve-month school year is being used now in whole or in part by certain schools and certainly there can be little argument against at least the last two clinical years being drawn up on such a schedule. The Joint Committee on Medical Education in Time of National Emergency recommends that under extensive national emergency periods medical schools should extend over four twelve-month years. This would mean that classes in the school of medicine would begin in July immediately following the close of the college year. The curriculum under such an expansion could absorb extra activities relative to the national emergency, even to the extent of field medical service under military supervision. In contrast to the accelerated program the twelve-month academic year would afford certain necessary adjustments without the compressed curriculum and thus be in keeping with psychologically favorable study patterns.

THE RESIDENCY TRAINING PROGRAM

In appraising the total program of formal medical education, unfortunately too many are inclined to visualize the conferring of the doctorate in medicine as the termination of this training process, and as a result of this error in thinking there is a real danger to the residency training program. A policy of deferment of interns and senior residents only does not visualize the basic need for an uninterrupted chain of graduate education especially in teaching hospitals where residents participate in the instruction of medical students. To jeopardize the program of residency training is to endanger the supply of specialists essential not only to civilian medicine but also to the Armed Forces. This fact has been supported and emphasized by the medical specialty career pattern developed by the Army during the past four years, a factor which played an important role in the swift and efficient solution of the early medical needs of the Korean conflict. Obviously all residents should not have blanket deferrals and those deferred eventually should come under public law 779 or some similar selective mechanism for

service in time of national emergency. However, as in the case of the faculty of schools of medicine, a certain proportion of the usual strength of residents must be maintained in the interests of national economy.

In determining the quota of interns who should be permitted advanced training several factors must be taken into consideration, such as the training of an adequate number of specialists to meet the needs of the Armed Forces and civilian population, the provision of sufficient residents to teach medical students and a provision of personnel for adequate hospital care of the population. There is no reason why a physician who has been on active duty should not be able to return and commence or re-enter the residency training program.

As has been discussed under the curriculum of schools of medicine in time of national emergency wherein the accelerated program proved to be a false economy, likewise the establishment during World War II of a "9-9-9" residency training period was equally deficient and the lack in quality of training afforded by this arrangement did not justify the temporary gain in medical manpower.

Though the following may not fall strictly within the province of medical education during a national emergency the problem certainly has a direct bearing on the medical manpower distribution and indirectly is extremely important to the medical undergraduate faculty strength and the graduate residents themselves. The Korean crisis brought to light the extreme weakness of our army medical reserve organization which should have supplied the "shock troops" to cushion the impact until redistribution of medical manpower was possible. The Army acted in good faith in calling the reserves, only to find that the crisis precipitated thereby was second only to that already existing in Korea. Pressures were brought to bear on the Department of Defense and editorials across the nation were addressed to the need for calling into uniform those who were educated at government expense or deferred during the last war. Finally public law 779 was enacted and the medical manpower situation was eased somewhat. Suddenly, many of those who had editorialized both by pen and mouth came to the realization that approximately 80 per cent of the residents across the nation fell into the draft specifications of the doctor draft law and to their dismay saw that the residency training program was jeopardized. Then through equally bold editorials there were pleas for the deferment of certain residents trained under the A.S.T. and V-12 programs. This is not presented as a defense of or accusation against any specified group but rather as a point of constructive criticism in an attempt to prevent a recurrence in the future.

The military medical reserve program must be organized so that a reserve is to all intents and purposes one who can be called into uniform immediately in time of emergency. As Gideon, the Israelite Warrior of old, utilized various methods of determining the will of his soldiers to fight, ending up with a fraction of his original band but a fraction which was victorious, so the medical reserve corps requires a thorough housecleaning with the elimination of those who are merely earning points toward retirement and a realistic determination of the number of men who can be counted upon in the event of future emergencies. Here then would be available medical manpower on whom the Armed Services could depend for immediate aid, thus permitting existing personnel facilities involved in medical care and medical education opportunity for redistribution without complete disruption of their programs.

In conclusion, to epitomize the thesis of this paper, medical education is as essential to the national economy in time of emergency as are war production plants and West Point or Annapolis. Though manpower shortage presents a serious problem it is extremely important that injudicious personnel economy does not jeopardize the quality of medical training, the poor effects of which will not be temporary but rather will persist through a generation of physicians.

DISCUSSION (*Abstract*)

Dr. Robert A. Moore, St. Louis, Mo.—If anybody is to defend medical education, it should be the deans of the medical schools. Two weeks after our school opened, one of our freshman students received orders to join the artillery regiment of which he was an enlisted reserve. When we talked to the military authorities, we were told by somebody wearing a star: "Well, the boy has only been in medical school two weeks. Nothing will be lost. We will just take him." We spent some time trying to convince the General that we could not replace this boy, that there would be one doctor less four years from now, and we finally convinced him. I think that is an example that if anybody is to defend medical schools it must be the deans.

The defense of this country is in part a matter of

scientific brains. Let us not sell the United States short on scientific brains by giving in to immediate emergency manpower demands that do not take the coming years into consideration. The deans must campaign to keep their students.

VISUAL AIDS FOR MEDICAL TEACHING AT A REASONABLE COST*

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One of the most acute problems in medical education is the shortage of teachers trained to give instruction during the first two years of the medical training. This shortage of teachers in the preclinical fields was given a prominent place on the program of the recent meeting of the Association of the American Medical Colleges. A symposium was devoted to the problems of recruitment of medical teachers and the president's address dealt with the problems resulting from the shortage of the teachers of the basic medical sciences. The shortage resulted partly from failure to exempt students in training for teaching jobs during World War II. It has been continued by lack of incentives, financial and otherwise, to attract sufficient numbers into the teaching of the basic medical sciences. The evidence indicates that the shortage will become more acute even if a national emergency does not necessitate expansion of the medical classes.

It should be emphasized that the shortage of preclinical teachers has developed at the time when there has been (a) the greatest number of applicants for admission to medical schools (b) the greatest increase in the number of students admitted into the first two years in medical study and (c) the greatest pressure for a further increase in the number of medical students. These circumstances should all have operated to increase the number of preclinical teachers.

The continuing shortage must result in a heavier teaching load for those medical teachers who remain in the teaching of the basic medical sciences. This heavier load will drive more teachers out of this field and intensify the existing shortage unless concrete steps are taken in the very near future. One of the concrete measures that could be used is the utilization of more audiovisual aids of all types in the instruction in the basic sciences in medicine.

Audiovisual aids including motion pictures, colored lantern slides and models have been demonstrated to save instructional time and to increase comprehension and retention. Through the use of audiovisual aids a given number of teachers can give instruction to a larger number of students. During the present shortage of preclinical teachers it will be necessary to use the audiovisual aids to enable the reduced number of preclinical teachers to give the maximum amount of instruction to an increased number of medical students. A secondary advantage lies in the fact that as the instruction is improved there will be an improved sense of achievement by the preclinical instructors and consequently fewer of them will desert the field of preclinical teaching.

But visual aids cost money and the budgets of the medical schools are already overburdened. It is not reasonable to assume that the medical schools can afford really large expenditures for visual aids to be used in the instruction of the students during their first two years of study. On the other hand, the shortage of preclinical teachers exists now and it cannot be advisable to postpone securing the visual aids by spreading the purchase over a very considerable number of years. Instead it is advisable, and indeed probably imperative, to determine which visual aids can be secured at low cost and to use them as effectively as possible until more money can be spent on better aids to replace the cheaper ones.

The costs of the different visual aids vary between very wide limits. For example, a colored sound motion picture which lasts for one hour costs approximately $300.00. Full size lantern slides cost about $2.00 apiece, if in black and white, and about $3.00 apiece if in color. For teaching purposes the 35 mm. colored slides are quite satisfactory and can be purchased for about $1.00 apiece. Some of the drug houses will supply copies of colored slides they have made for as little as $0.25 apiece. The Medical Film Institute is developing a project for the distribution of unmounted strips of 35 mm. colored pictures for about 10 cents each. A still cheaper type of visual aid is now a theoretical possibility. A relatively recent modification in the construction of a motion picture projector has made it possible to use 16 mm. film as a film strip. The individual pictures may be projected with enough brilliance for use before a full sized medical class. Copies

*Chairman's Address, Section on Medical Education and Hospital Training, Southern Medical Association, Forty-Fourth Annual Meeting, St. Louis, Missouri, November 13-16, 1950.

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of the individual pictures could cost as little as one-half cent each.

During this presentation a motion picture will be shown and immediately afterwards a series of stills taken from that motion picture will be projected. The cost of a copy of that portion of the motion picture is about $25.00. The cost of a copy of the individual frames from that motion picture is about 25 cents. Certainly any medical school could afford to spend the 25 cents.

Another possible way of achieving greater use of the visual aids is through cooperative use of motion pictures by a number of the medical schools in a given geographical area. A number of medical schools could purchase films jointly and so spread the cost between three or more schools. Perhaps it might be even more satisfactory if three or more medical schools agreed to loan film to each other. Such an arrangement would enable each of the schools to own the films they deemed most useful. It would also decrease the amount of time spent on conferences devoted to the decision as to which films should be paid for jointly by the cooperating schools. The teaching schedules of the medical schools differ significantly and it would be possible to use most of the teaching films at the most suitable time in the teaching program of at least three schools. The cost of the transportation of the films between the schools would be minimal if the cooperating schools are located close to each other as are the three medical schools in the state of North Carolina. Probably the cooperative use of films could best be arranged by the individual departments within the schools.

The shortage of preclinical teachers and the budgetary difficulties of the medical schools indicate the necessity for the development of and the distribution of the cheaper visual aids which will save instructional time and increase comprehension and retention.

Another way of saving teaching time is to record on wire the presentation that the teacher usually gives at the time when the silent motion pictures or film strips or lantern slides are shown. These recordings can be played back in connection with the silent motion pictures or film strips or lantern slides. The cheapest way to do this is to make the film strip on 16 mm. film and to have a technician advance the film strip from one picture to the next as is needed to synchronize the pictures and the recording. This results in a "canned presentation" instead of an illustrated lecture but it can have certain advantages over a lecture. These "canned presentations" can be presented in a small room for a portion of the class. Because the time of a technician rather than the time of a professor can be used, the showings can be scheduled at frequent intervals and the students can view them at the time most suited to the needs of the individual students. This might help us escape from the lock step methods of medical instruction which has resulted largely from the necessity of having all of the students in a given class attend a lecture that is scheduled at a time when the lecture room happens to be available.

The cost of such a presentation lasting for an hour would be $4.00 for the wire, a maximum of 50 cents for the 16 mm. film strip and the cost of the time of the technician. Additional showings would cost only the time of the technician. Most of these showings would last less than an hour. Since the sound on the wire can be erased, or parts of it removed, or new parts added, the presentation can be altered as many times as is desired.

Such an experiment is under way at Duke. The results of the experiment will be reported at a later time.

Technics are already developed which permit the mechanical coupling of a silent motion picture and a wire recorder. With the recorder and projector coupled together it is possible to record the description that is to accompany any silent film that one may own. This mechanical coupler assures perfect synchronization of picture and sound. The cost of the sound is about $4.00 per hour. This kind of teaching motion picture made up of a silent motion with separate but perfectly synchronized sound has many advantages over the older sound on film motion picture. The main advantages are: (1) lower cost, (2) greater flexibility, and (3) the possibility of having as many different descriptions of the film as are needed for the different audiences to whom the film is shown. Such projections can be supervised entirely by a technician. Consequently, the frequent showings of such film can replace lectures given by professors. Since the recording can be made by the professor, the material that is taught can be entirely under his control. These audio-visual aids can be truly integrated into his teaching program.

All of the verbal material which a professor desires to present to the entire class can be prepared by him. The presentation of this material to the class requires the time of only the tech-

nician. The professor's time can be devoted instead to the much more important function of contact with the individual students.

Perhaps there may be a few medical teaching motion pictures which should be made with the sound on the film. However, the great advantages of the separate sound on wire may result in refusal of the medical schools even to replace the present type of sound motion picture projectors when equipment they now own does wear out.

The coupled separate silent picture and sound should have the effect of making the teacher conscious of his ability to modify the motion picture in the ways that are necessary to adapt it to his teaching. The fact that the same equipment is used to record and to play back the sound, means that the users of the synchronized sound and film will have the facilities for changing the sound. This ability to change the sound and to delete undesirable portions of the film may result in the more general use of motion pictures in medical teaching. Some of the best medical teachers have not used films because they objected to certain parts of a film. They may now select the parts of a film that meets their approval and by recording their own description they may make the available motion pictures fit into their own teaching programs. In the past, most of the medical teachers who have used films extensively have also produced films. They have had the facilities for making films that would fit into their own teaching programs and also, the facilities for altering the films so that they could be incorporated as an integral part of their teaching. Perhaps the ability to make the necessary alterations in films is what really determines whether a good medical teacher will use films extensively in his teaching.

If a film is to be used jointly by a number of schools or departments, each user could make his own recording of the sound or description that is to accompany the film. The wire on which the sound is recorded would cost approximately one-fortieth as much as the film. Therefore, the cost need not prohibit each user from owning a separate sound recording on wire even when films are used jointly by a number of schools.

Perhaps the relative cost of sound on film and separate sound on wire should be compared. Sound film is projected at a rate of 24 frames per second. Consequently, the sound must add at least 50 per cent to the cost. On the other hand, the wire costs about 2.5 per cent as much as the silent film or about one-twentieth as much as sound on film.

Perhaps the international situation will not result in the necessity for training more M.D.s in a shorter period of time, and with an already reduced preclinical staff. However, it should be pointed out that there is already a shortage of preclinical teachers, and because of that shortage we should now take the steps which will result in the most effective teaching by this restricted group in the event of the kind of a national emergency which will require the training of more M.D.s.

Some of the ways of using the cheaper visual aids to save instructional time may be summarized as follows: (1) the joint use of films by a number of schools that are located close together, (2) the procurement of lantern slides or film strips from the drug houses, (3) the duplication of unmounted 35 mm. films in strips by the Medical Film Institute or other film agencies, (4) the production and distribution of 16 mm. film strips, and (5) the recording of sound on wire to be synchronized with existing silent motion pictures.

NUTRITION IN RELATION TO THE SOIL*

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In 1928, in his book, "The Science of Nutrition,"[1] Graham Lusk defined nutrition as:

> "The sum of the processes concerned in the growth, maintenance, and repair of the living body as a whole or of its constituent organs."

This concept of nutrition has given way in recent years to a broader one which has been expressed by Sir Cedric Stanton Hicks[2] as:

> "A continuous flow of material from the soil and back to the soil."

Recognition of the fundamental relationship of nutrition to agriculture and to soil programs led to the establishment of the Food and Agriculture Organization of the United Nations.

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This relationship is epitomized by FAO in the statement that:

"Over those parts of the earth not covered by water lies a thin crust of soil, perhaps equal by comparison to the thickness of a sheet of tissue paper wrapped around a globe six feet through. Much of this soil is inaccessible for cultivation, or it is unusable for other reasons. From the rest the world's growing population, now more than 2,000 million, must draw all their sustenance except what they get from the sea; and even the fishes, like all other living things, are fed in the final analysis out of the fertility of the land. Whether this thin layer of soil is to be a wasting asset or one maintained in perpetuity and made more fruitful for mankind will depend on how it is used and managed. Nothing more deeply concerns the well-being of men and nations."[3]

What is the nature of this relationship between man and the soil? This is not an easy question to answer. Nor can it be answered at the present time in great detail. Studies of the biochemistry of the soil and of plants are just beginning to be as extensive as some of the knowledge that we now have concerning our own biochemistry and metabolism. Furthermore the many observations made concerning geographical differences in soils and their effects on plant and animal nutrition have been limited to the practical results necessary in farming and animal husbandry. The program of experimental work necessary to put soil science on a completely predictable basis and to relate it to human nutrition is under way and each new finding seems only to increase the complexity of the problems involved.

Much has been written concerning the relationship between the fertility of the soil and the nutritional quality of the food that is raised on it. A great deal of this literature is designed for popular consumption and relies on faddism, emotional appeals, and propaganda of various types rather than on sound experimental evidence. Some of the practices advocated are sound, but often the reasons given for them are highly fantastic. Hypotheses that a causal relation exists between soil fertility, fertilizer practice, and certain human diseases have been advanced. Correlations between the incidence of certain diseases and agricultural practices have been cited, but no causal relationships have been proven. Although it may be impossible to disprove these hypotheses at the present time, there is no reason to believe them.

A number of concepts have been advanced to explain the functions of the soil.[4] About a century ago, when chemistry was a new science, the soil was considered to be like a bank into which a certain amount of chemicals had to be added per unit of crop produced. More recently some have considered the organic matter in the soil of prime importance. While the organic matter in the soil is essential for maintenance of its physical properties, the mystical qualities ascribed to humus by some schools do not appear to be borne out by experimental evidence. There has also been much argument that one must use "balanced" fertilizers, presumably containing all the necessary elements in correct proportions. Such arguments are based upon a static concept of soils. But from our present point of view[5] the soil is considered to be a very dynamic and living substance formed from the underlying parent rock by the effects of climate, vegetation, relief, and time. Normal erosion reduces the surface and adds new materials from the rock below. Each distinct combination of these factors gives a soil with a unique set of characteristics, a soil type. Each soil type has an individual chemical and physical make-up, and its own particular potentialities. Consequently, soil is continuously being rebuilt and each soil type has its own particular fertilization and management needs. Some soils will be productive indefinitely while others will be productive only under certain types of management.

In considering the relationships between the soil and human nutrition we have to deal with the food that is served on our tables. Only if the food we eat is found to be deficient in a factor that can be traced directly to the soil can we say that there is a direct relationship. In this country at the present time the food consumed by practically all of the population comes from a variety of regions. It has been subjected to the effects of processing and cooking. The combination of these effects may so influence the food that any unique contribution of a soil may be almost entirely obscured. In foods of plant origin the changes in composition due to local variations in soil types are much greater than are variations found from one part of the country to another. As will be seen later, genetic and climatic factors are even more important. In this country there is almost no opportunity to study the nutrition of a group of people who obtain all of their food from the small area of land on which they live although studies of this type would give us badly needed information.

A distinct relation between the soil and human disease has been established for only one nutrient, iodine. Even this relationship is considered by some to be more appropriately due to factors other than simple iodine-lack. Simple goiter is a recognized result of a deficient intake of iodine. The addition of iodine to table salt in the deficient areas has done a great deal to reduce the incidence of this disease. Although other mineral deficiencies in the soil have been related to animal diseases, there is no conclusive evidence at the present time of any human deficiency of these substances.

The soil and the crops which it produces are the ultimate source of our food supply. The nutrition of the people in the world depends upon the amount and on the quality of the food produced. This depends, in turn, on two factors: the amount of land available for agriculture and the amount and type of food produced on this land. One of the problems facing us today is the effect of varying soil composition on the quality as well as the quantity of food which may be produced. For the purposes of this discussion let us first consider foods of animal origin.

In the United States a large part of our food is of animal origin.[6] We obtain on the average 80 per cent of our calcium, 70 per cent of our phosphorus and riboflavin, 60 per cent of our protein, 45 per cent of our niacin, and 40 per cent of our thiamine and iron from animal foods. Since such a large part of our calcium and phosphorus intake comes from milk and other dairy products (about 75 per cent for calcium), the amount of milk in our diet will in large part determine our calcium intake. Let us reflect for a moment on the contribution of milk. Is the calcium content of milk influenced by the amount of calcium in the feed of the cow? The calcium content of the milk is not influenced by the diet of the cow. The same is true for the phosphorus content of milk. Since milk and milk products are the main source of calcium in the diets consumed in this country, the amount of milk in the diet is of greater importance than the amount of calcium in the vegetable foods.

In a similar manner the iron content of most animal foods cannot be influenced by diet. There is very little iron in milk, so little in fact that a diet of milk alone during the second year of life is frequently the cause of an iron deficiency anemia. Increasing the iron content of the feed of the cow is without effect on the iron content of the milk. As far as the infant is concerned the addition of a food naturally rich in iron is the rational approach to the problem. Eggs, for instance, have a high content of iron, again independent of the iron intake of the hen.

The trace elements have not been studied as extensively. It is known that their concentration in milk varies considerably, and in some instances this variation reflects the dietary intake of the cow. However, we know very little about the relative importance of such a food as milk as a source of these elements in the human dietary or whether they are even necessary in human nutrition.

The amounts of vitamin A and fat in milk are variable. The type of roughage, its maturity when harvested, and the period of storage influence the vitamin A concentration. None of these factors is directly related to the soil. There is some variation in the amount of the B complex vitamins in eggs depending on the types of feed used and on the amount of vitamin supplementation. Tremendous amounts of synthetic vitamins are used in the manufacture of poultry feeds. The thiamin, niacin, and riboflavin content of meat, however, is not so variable and is not influenced significantly by what the animal eats. The protein of animal tissues is remarkably constant in its composition. The protein intake of animals appears to have no influence on the composition of the protein of the tissues.

The animal foods which are so important in the dietary patterns found in this country maintain their composition within relatively narrow limits. The effects of the soil on the quality of these foods are negligible. What is important to us is the fact that the amount of livestock which can be profitably raised on a given area of land bears a direct relation to the fertility of that land. Measures which will increase that fertility will result in an increase in the production of animal foods. It must also be remembered that animal feeds obtained commercially are derived from diverse regions and are subjected to the mixing and processing factors already mentioned for human foods.

Foods derived from plants are relatively more important for people living at the lower economic levels. Plant foods are also more susceptible than animal foods to changes in the soil. Before discussing some of the experiments which have been made concerning the relations between the soil

and the nutritive value of plants, it is essential to point out two very important facts. There are relatively few plants which will thrive on poor soils. Soils which are naturally better or which have been improved by good management will support the growth of a wide variety of crops. Furthermore plants of better quality often require especially fertile soils. For example, improvement of a soil used for the production of grass for fodder will make possible the raising of alfalfa, which is more fastidious in its soil requirements. Alfalfa has a higher content of protein, calcium, and carotene than grass. This, in turn, permits the production of more meat and milk per acre of land with obvious implications for human nutrition. In general, the greater variety and amounts of vegetables which can be produced on naturally fertile soils provide us with a better diet. The effects of soils of different types which often occur in close proximity must also be considered. It has been noted that the differences in the quantity and quality of the crops produced on different soil types is often greater than the effects of fertilization and good land management on a particular type of soil.[7] These local differences in the soil are also much greater than the differences found between separated regions of the country.

Recently several experiments designed to answer the question, "Does higher soil fertility result in higher nutritive value of the crop produced?" have been carried out. Data published by the Tennessee Experiment Station[8] show the soils of the Central Basin of Tennessee to be six times as rich in phosphate as the soils of the Highland Rim, and to produce lespedeza forage containing over twice as much phosphorus. Animal experiments are cited to show the superior nutritive value of the phosphorus-rich hay. In contrast to the situation in animal nutrition, getting enough phosphorus into the human dietary is a minor problem.

Studies on other minerals have shown that fertilization with a given mineral increases its content in a specific crop in a specific location. Other studies, however, have shown that these results do not hold for the crop in the same area another year or for crops in another area the same year. Because of these other variables, generalizations in terms of animal and human nutrition are of limited value.

The most complete and reliable information regarding the effects of fertilization has come from cooperative studies by several Southern experiment stations.[9] Twenty-nine experiments in 6 states were carried out to study the effects of 16 different fertilizer treatments on the calcium, iron, and phosphorus content of turnip greens. The addition of phosphorus to the soil increased the phosphorus content in 27 of the 29 experiments. At the same time the iron and calcium content was decreased. The addition of calcium resulted in significant increase in only 4 experiments. Nitrogen produced a great increase in growth accompanied by a significant fall in the calcium and iron content. The variations from place to place and from year to year were large. Fertilization which increases the yield may not necessarily increase the nutritive value. However, this conclusion should not cause us to overlook the importance of soil fertility in terms of yield of nutrients per unit of land.

In some instances it has been reported that soil fertilization of one type or another has improved the nutritive value of the forage grown on the land. While such observations are often valid, the interpretation must recognize that there is almost always a change in the actual variety of forage crop which grows on the soil following such treatment and that the result achieved has not been an improvement in the nutritive quality of crop A, but, instead, a substitution of crop B for crop A.

Plants are our main sources of ascorbic acid and carotene. The variations in the concentration of these vitamins in plants which are due to genetic and climatic factors are the most important. In tomatoes, marked differences in growth due to variations in mineral supplies had little influence on their vitamin C, carotene, or riboflavin content. The effects of mineral nutrition on the content of vitamins of the B complex group of the cereals are not of significance in human nutrition at the present time because these factors are removed during the milling process.

Eighty per cent of the plant protein consumed in this country comes from the grains, primarily wheat. While there is at least a 20 per cent natural variation in the protein content from different sources, the mixing that takes place during storage and milling allows the marketing of a product of fairly constant composition. At present the biologic value of the proteins of animal forages grown on various soils is under

study. Conclusive results on this interesting question have not yet been reported.

The final test of the nutrient value of plants is their ability to maintain the growth and reproduction of animals and man. While it is not feasible to plan feeding experiments of this variety for human subjects, groups of farm animals can be given foods raised on soils of varying fertility and management. This type of experiment or biologic assay is more valuable than analyses of the mineral or vitamin content of plants or animals since it allows for the effects of unidentified factors and the complex interrelationships between nutrients which have been found. Only short-term experiments of this type are available at the present time. So far no conclusive results have been reported. When experiments of this type have been continued through the critical periods of growth and reproduction we may expect to have some decisive information on the relationship between fertility of the soil and the nutritive quality of the food it produces.

This review of our present knowledge of the effects of the soil on human nutrition has demonstrated the complexities of the problems involved. Only in the case of iodine can a direct relationship be demonstrated. Other suggested relationships have not been subjected to adequate scientific study. The fertility of the soil determines the level of nutrition of the population supported by that soil through quantity and quality of food which may be produced. Naturally fertile soils allow the production of a great variety of plant foods of high nutritive value and the maintenance of livestock in abundance. With the increase in the number of mouths which must be fed, relatively poorer soils must be utilized. Increased food production may be attained by land management and fertilizer programs designed specifically for the needs of these particular soils. Even greater increases in the quality of the food produced may be attained by the development of types of plants having superior nutritive value and breeds of animals adapted to the soils and to the climatic conditions of different regions. The food supply available to future generations will depend in large part upon our ability to utilize to the fullest extent the soils that we have at present. The present high rate of food production in this country is a reflection of the application of our knowledge to the soil. Nevertheless there is a tremendous need for continuing research on an ever expanding scale until all of the factors involved in food production become appreciated.

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TREATMENT OF ACUTE TOXAPHENE† POISONING IN THE DOG*

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Within the last two years toxaphene has come into very wide use in the field of economic poisons and at least one case of toxaphene poisoning in man has occurred.[1] It, therefore, seemed desirable to test the efficacy of some of the common central nervous system depressants in treatment of acute poisoning by this agent.

Observations[2] on dogs have shown that toxaphene in a dose of 15 mg. per kg. may result in convulsions and death when administered by stomach tube as a solution in a digestible oil. A dose of 50 mg. per kg. so administered was uniformly fatal. Accordingly each of 64 mongrel dogs was fasted for 18 hours while having free access to water and was then given by stomach tube a dose of 50 mg. per kg. of toxaphene dissolved in corn oil. Treatment was initiated at the onset of convulsions or in some instances before the expected convulsions began. In treatment, one or more of the following drugs was employed: morphine, methadon,® paraldehyde,

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*From the Department of Physiology and Pharmacology, Southwestern Medical College, Dallas, Texas.

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†Toxaphene is an economic poison manufactured by the Hercules Powder Company. Chemically, it is a chlorinated terpene having the empirical formula $C_{10}H_{10}Cl_8$.

dilantin,® tridione® with urethane, and the solium salts of amytal,® pentobarbital and phenobarbital. To some animals, mineral oil was also administered by stomach tube in doses of 200 ml. in an attempt to retard absorption of the toxicant. All the drugs except paraldehyde were administered intravenously and generally in divided doses, the initial dose being supplemented as seemed advisable in an effort to control convulsions. Paraldehyde was administered by stomach, by rectum, and by intramuscular injection.

Methadon® in doses of 14 mg. per kg. was ineffective in control of convulsions or in saving the life of the animal. Morphine sulfate in dosage up to 70 mg. per kg. did not control convulsions. Tridione® in urethane was given to a single dog in divided doses until a lethal amount (2,000 mg. per kg.) was used without effecting a control of convulsions. Paraldehyde to the amount of 1.5 ml. per kg. was generally effective when given intramuscularly but was unsatisfactory because this amount could not be so administered without producing sloughs. It was less effective when given by rectum or by mouth.

Dilantin® in a dose of 10 mg. per kg. was without apparent effect when given after convulsions had begun or when they recurred after having been allayed with phenobarbital. When given before the appearance of convulsions, dilantin® made it possible to control the convulsions with smaller doses of phenobarbital than were found to be required when the latter drug was used alone.

All of the barbiturates used (phenobarbital, pentobarbital, and amytal®) were effective in controlling convulsions and preventing death from toxaphene. Of 8 dogs in which treatment was limited to the use of pentobarbital, 5 to the use of amytal,® 13 to phenobarbital, 6 others in which phenobarbital was used together with dilantin® and 10 in which phenobarbital and mineral oil were used, there were only 3 fatalities. With 30 of these 42 animals, treatment was instituted before the expected convulsions actually began. Of the 3 deaths, all occurred in the remaining 12 animals which were allowed to exhibit convulsions before treatment was begun.

Though the number of animals used is perhaps too small for definite conclusions, we are of the opinion that when treatment was instituted before the onset of convulsions, phenobarbital was the most effective drug used. However, when convulsions have already developed our experience indicates that pentobarbital can be used more effectively, probably because it is practicable to give a full anesthetic dose of it. It was our practice to give as an initial dose 40 to 60 mg. per kg. of phenobarbital, 40 mg. per kg. of amytal® or 30 mg. per kg. of pentobarbital. Additional amounts were given later as required.

The observation by Lackey[2] that dogs survive very large doses of toxaphene when it is administered as a solution in an indigestible oil led us to the use of mineral oil in an attempt to decrease absorption of the toxicant.

If given early, a large dose of mineral oil was apparently effective in decreasing absorption. This was indicated by the greater ease of control of convulsions by depressant drugs. With one animal which received mineral oil 20 minutes after toxaphene, no further treatment was required and no symptoms whatever were observed, the animal remaining playful throughout the day and eating heartily in the evening.

Contrary to our expectations, we get a strong impression that the younger dogs withstand toxaphene better and respond more readily to treatment than do the older animals.

Whatever the drug employed in treatment, the control of convulsions is distinctly more readily effected if the treatment is instituted before the onset of seizures. Once convulsions have begun, it seems advantageous to build up the dosage of the anticonvulsant as rapidly as possible to a level sufficient for their control since the longer they persist the more difficult to control they become.

SUMMARY

In dogs given lethal doses of toxaphene by mouth, convulsions may be controlled and the life of the animals preserved by adequate dosage of sodium pentobarbital, sodium phenobarbital or sodium amytal® administered intravenously. The treatment is more effective if initiated before the onset of convulsions but if convulsions begin before treatment is instituted, sodium pentobarbital seems to be the drug of choice.

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MODE OF ACTION OF MODERN BLOOD STREAM ANTISEPTICS

Discovery of the two great modern groups of antiseptics, the sulfas and the biotics, came accidentally and empirically, rather than from expected fields. Physiologic reasons for their antibacterial activities were not known. In the past ten to fifteen years since their popularization, many studies of the mode of action have been made, in the effort to devise more potent products.

The sulfa drugs apparently act by inserting themselves as a poison into an essential reaction of bacterial metabolism. They bear a close resemblance to a food substance necessary for bacterial growth, but contain a modification which makes them different, and apparently disturbing to bacterial function. They thus may be considered in the class of antivitamins, for bacteria.

According to Woolley,[1] of the Rockefeller Institute, toxic antibacterial substances may be best prepared by finding a biological precursor of a vitamin which the particular bacterium can synthesize and does synthesize during its growth. If the chemist can then modify this slightly, prepare an analog, a harmful product which will selectively displace the required precursor in the bacterial synthesis, this analog will be toxic for all bacteria which synthesize the vitamin. Some strains of bacteria will not synthesize the vitamin, but require it already complete. These species will be resistant to poisoning by the analog. He cites various instances in which his theory holds. Sulfanilamide, he says, is toxic for certain bacteria which synthesize folic acid, to which it bears a structural resemblance, and not for higher animals and human beings, which require folic acid in finished form.

If a single precursor could be found for two vitamins, it should be destructive to all bacteria which synthesize the two. Woolley selected a single precursor of riboflavin and vitamin B_{12}, a dimethyl diamino benzene of formula which made it probable that it was a precursor of both riboflavin and B_{12}. It is believed to be a part of both. An analog, or antimetabolite, was prepared: a similar dichloro instead of dimethyl product. This was then tested for inhibiting properties against a group of 26 different species of bacteria. Resistance of the organisms, in keeping with his theory, was closely correlated with their requirement for the two vitamins. Those which required them in finished form were quite resistant; those which did not require them but synthesized them, were susceptible. Susceptibility of the bacterium to the antiseptic could be prophesied from an understanding of the particular microbe's nutritional requirements.

This is an extremely interesting theory, with which Woolley was able to explain phenomena of susceptibility and resistance, and logically to prepare an antibacterial substance. It should be a stimulus to further improvement of the antiseptics.

An explanation is immediately suggested for the continued resistance of the viruses to blood stream antiseptics. These minute bacteria have probably higher nutritive requirements than the microscopic groups and are less able to synthesize elements of their food supply. They do not readily assimilate simple poisonous analogs. Being intracellular parasites, they presumably have available all the food materials of the living host

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cell prefabricated. The very complexity of their nutritive requirements prevents their being poisoned by the bacterial antivitamins.

PROPHYLAXIS OF GONORRHEAL OPHTHALMIA

When Credé, in 1881, observed that ophthalmia neonatorum could be prevented by instillation of a few drops of silver nitrate solution into the eyes of the newborn, he eliminated one of the greatest causes of blindness of children. His method was used with little change for more than fifty years, and through the modern period of antisepsis of the past fifteen years it has still been the most extensively employed means of prophylaxis for this distressing disease.

Until the advent of the sulfa drugs there was no specific therapy for neisserian infection. Treatment depended upon various local instillations or applications which rarely effected a total sterilization. With the coming of the sulfas and later of penicillin and the other biotic preparations for control of the gonococcus, and with continually improving prenatal care, there are fewer infected vaginas for the infant to traverse. Infection from the mother is increasingly less common; and there are other materials than silver nitrate which may be used in the eye if the law permits their substitution. These are worthy of study.

Many states have statutes specifically requiring the instillation of a particular strength of silver nitrate into the eyes of all newly born. This legislation to some extent interferes with medical progress.

Disadvantages of silver nitrate, according to Bickel,[1] of Louisville, are: (1) it occasionally fails to destroy all the gonococci. (2) It may cause a chemical irritation and conjunctivitis troublesome in some infants. (3) It has occasionally caused blindness when too strong a solution was employed by mistake. This has been eliminated since the use of 1 per cent solution in wax ampules, instead of the stronger 2 or 3 per cent solution. Silver acetate instead of nitrate also has been suggested. It has the advantage of being less soluble and thus less likely to be applied in an irritating strength.

Beginning in 1943, sulfathiazole was given by mouth as an adjunct therapy for infants in some hospitals. In 1947, penicillin was instilled and found valuable in a series of cases, though it was disputed whether it was better or as good as silver nitrate. Another series of infants received a drop of silver nitrate in the eyes in the delivery room and intramuscular penicillin G, 50,000 units, immediately on entering the nursery. This completely prevented the eye infection in a series of more than four thousand infants. By some workers, intramuscular penicillin alone was reported to be equally good.[1]

Bickel[1] investigated the effectiveness of sodium sulfacetimide, both as 30 per cent solution instilled into the eye, and as 10 per cent ointment. The 30 per cent solution was found to be less irritating than the ointment and it was apparently very effective in a small series of cases.

Large numbers of cases are of course needed to establish a new prophylactic method for a condition long successfully treated. However, there is every reason to believe that the modern antiseptics may be an improvement over the old.

CLUB FOOT

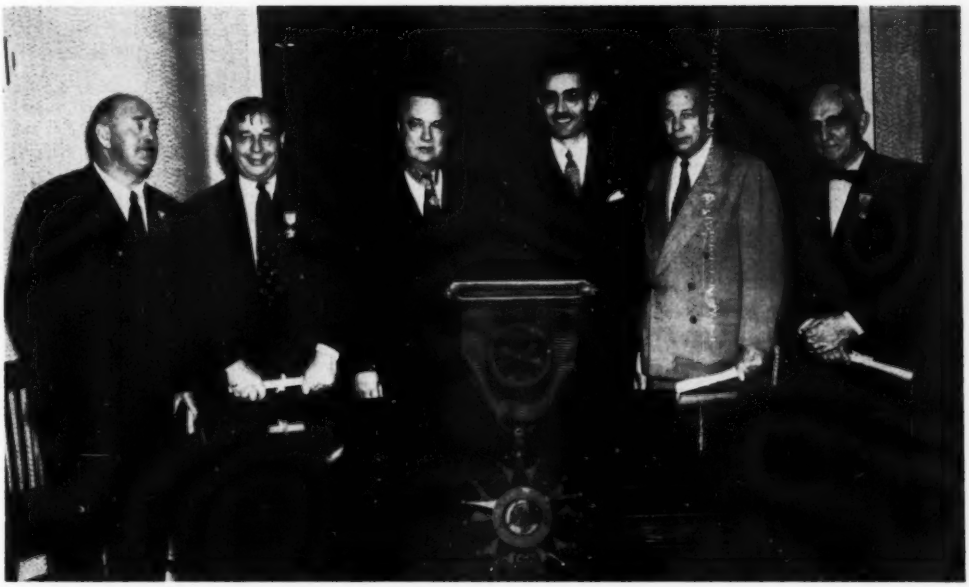
Club foot is in a way a minor deformity or developmental defect. Yet its anatomical origins may be detected in the three-month fetus. Bechtol,[2] of the University of Wisconsin, has reported detailed studies of two early fetuses with club feet, one a severe case with abnormal musculature in a number of situations. Middleton earlier reported prenatal lesions of striated muscle as causing several types of deformities.

Retarded development of muscles in the first of Bechtol's cases led to imbalance of opposing muscles, which affected bone shape and joints of the extremities, causing bending and a tendency to displacement of articulation. Joints of the sixteen-week fetus were retarded to the twelve-week stage, by muscular pull in abnormal directions. This seemed to show a possible mechanism of anterior dislocation of the hip. As muscle fiber

Continued on page 170

1. Bickel, J. Edmund: Sodium Sulfacetimide for the Prophylaxis of Gonorrheal Ophthalmia Neonatorum. Preliminary Report. J. Ped., **37**:854 (Dec.) 1950.

2. Bechtol, Charles O.; and Mossman, Harlan W.: Club Foot, An Embryologic Study of Associated Muscle Deformities. J. Bone and Joint Surg., **32** A:827 (Oct.) 1950.



CARLOS J. FINLAY AWARD

In Havana, Cuba, in the late afternoon on Sunday, January 14, the Carlos J. Finlay Award for distinguished service in the field of medicine and public health, the highest honor that can be bestowed in the field of medicine in Cuba, was given to Dr. Elmer L. Henderson, President of the American Medical Association, President of the World Medical Association and Past President of the Southern Medical Association, Louisville, Kentucky; Dr. George F. Lull, Secretary and General Manager of the American Medical Association, Chicago, Illinois; Dr. Tom D. Spies, Director, Nutrition Clinic, Hillman Hospital, Birmingham, Alabama, and Professor and Head of Department of Nutrition and Metabolism, Northwestern University Medical School, Chicago, Illinois; Dr. Paul de Kruif, Author and Science Writer for *The Reader's Digest,* Holland, Michigan; and Mr. Clyde P. Loranz, Secretary and General Manager, Southern Medical Association, Birmingham, Alabama.

The formal presentations were made in the Auditorium at the Finlay Institute in the presence of a large number of distinguished Cuban physicians and their wives and friends. Senor Dr. Jose A. Rubio Padilla, Minister of Health of Cuba, a cabinet post, presided giving a most appropriate address and presenting the award individually to each of those to whom it had been given. The award is evidenced by the beautiful Finlay medal and a scroll signed by the President of the Republic of Cuba. On the front of the medal are the words "Orden Carlos J. Finlay 1928" with a bust of Dr. Finlay and on the back the words "Por la Salud y la Beneficencia Publica" with the crest of the Republic of Cuba. Following the formal presentations in the Auditorium there was a reception in honor of those receiving the award. In the above picture taken immediately after the awards had been made and the medals pinned on the recipients by Senor Dr. Rubio Padilla, are from left to right: Dr. de Kruif, Dr. Spies, Dr. Henderson, Senor Dr. Rubio Padilla, Dr. Lull and Mr. Loranz. (The picture of the medal is superimposed on the group picture.)

Continued from page 168

abnormalities develop, some fibers growing faster than others, the posterior calf muscles of the three-month fetus with club foot displayed many abnormal embryonic muscle fibers, about half the total number. Skeletal muscle abnormalities he thinks probably a factor in congenital posterior angulation of the tibia and in congenital dislocation of the hip and acetabular dysplasia. A theory of the probable early stage of arthrogryposis, an unequal maturity of opposing muscle groups, is depicted. Fetal positions of the joints were retained as the result of insufficient total muscle volume.

The only deformity of the second fetus was club foot. Degenerating muscle fibers failed to keep pace with skeletal growth, and the relative shortening of the fibers caused deformity and displacement of the bones. In both fetuses, skeletal structures of the foot apparently developed normally until they were displaced by abnormal muscle forces.

If these muscular deformities may be considered as nutritional defects of the fetus, then muscle nutrition is to be studied particularly in relation to club foot, congenital dislocation of the hip and arthrogryposis. The defect must be active very early after nidation, to be well developed in the fetal parts at twelve to fifteen weeks.

TWENTY-FIVE YEARS AGO

From Journals of 1926

Dallas Session of A.M.A.[1]—Typical Texas entertainment is planned for the Annual Session of the American Medical Association, which will convene in Dallas, Texas, April 19-23. A barbecue tendered by Dr. John H. Dean for the 5,000 physicians, guests and exhibitors, totaling more than 10,000 visitors to the Lone-Star State, is an unusual feature planned for this occasion. Eminent physicians will witness carving under the supervision of Mr. Max Hahn, for forty years expert "barbecuer" of Dallas.

Last June, Dr. Dean selected eighty cows with calves about 6 weeks old out of a herd of 4,000 * * * The eighty cows and calves were turned into a six-section pasture which had not been used, * * * assuring the cattle of a properly selected, scientific diet. It is customary to wean calves from the mother after six months, but this plan was not followed with the calves to be used for the barbecue, * * * A full diet was begun for the cattle in December. The calves will be killed in advance of the session and the meat prepared so as to be in the best condition for the barbecue. Mr. Tony Bazar, with a corps of able assistants, has been delegated to arrange for the service during the barbecue.

Tuberculosis Therapy.[2]—In spite of the disappointing results from the use of "Sanocrysin" in animal tuberculosis in the careful experiments carried out for the Hygienic Laboratory by Drs. Theobald Smith, William H. Park and E. C. Schroeder, it is possible that some renewal of interest may arise as a result of recent papers by European physicians on the use of sodium gold thiosulphate in human cases of tuberculosis * * *

The tendency to study the influence of therapeutic agents on human diseases is followed more widely in European countries than is now the custom in the United States * * * There should be some assurance of the value of a drug in animals before human experiments are justified * * * Every trial in the past with gold has failed.

1. Association News, Dallas Session. J.A.M.A., **86**:490 (Feb. 13) 1926.

2. Editorial: "Sanocrysin" Again. J.A.M.A., **86**:487 (Feb. 13) 1926.

Book Reviews

A Textbook of Gynecology. By Arthur Hale Curtis, M.D., Emeritus Professor and Chairman of the Department of Obstetrics and Gynecology, Northwestern University Medical School; Formerly Chief of Gynecological Service, Passavant Memorial Hospital, Chicago; and John William Huffman, M.D., Associate Professor of Obstetrics and Gynecology, Northwestern University Medical School; Attending Gynecologist, Passavant Memorial Hospital, Chicago. Sixth Edition. 799 pages, with 466 illustrations, chiefly by Tom Jones, including 37 in color. Philadelphia and London: W. B. Saunders Company, 1950. Price $10.00.

Only two years have elapsed since the publication of the previous edition of this standard textbook and the present revision is done in collaboration with Dr. John W. Huffman. The chapters have been revised and some new material has been added, making an addition of 55 pages.

Much of the accumulated knowledge in the fields of endocrinology and gynecologic physiology is explained too briefly or is omitted altogether. Many gynecologists will not agree with the authors' belief that estrogens are not to be used in cases of endometriosis. No mention is made of the problem of "irregular shedding" of the endometrium. The continuance of uterine bleeding following cessation of estrogen therapy is given as an indication for curettage. The value of progesterone administration to cases of artificially produced endometrial hyperplasia is not brought forth.

Great concern is expressed over the possibility of estrogens being carcinogenic, while the dangers of irradiation are passed over lightly. This is especially true in the discussion of irradiation of the ovaries in young women for the temporary suppression of menstruation. The erroneous impression is conveyed that this is a common therapeutic procedure. Little space is given to everyday office practice. More amplification is needed

in the discussion of leukorrhea, bleeding problems, and sterility.

As in previous editions the chapters and sections on anatomy, embryology and gross pathology, as well as the illustrations, are most helpful.

Clinical Orthoptic Procedure. A Reference Book on Clinical Methods of Orthoptics. By William Smith, O.D., Associate Instructor in Optometry and Instructor of Orthoptics and Visual Training, Massachusetts School of Optometry, Boston, Mass. 393 pages, with 70 illustrations. St. Louis: The C. V. Mosby Company, 1950. Price $8.00.

Because this book is by an optometrist, physicians and medical orthoptists will view it with critical faculties alert; and they will find that in the main it is an excellent work. Obviously, the author is enthusiastic and sincere and it indicates the similarities in the thinking of the ophthalmic and the enlightened, honest optometric approaches to muscle problems.

A main contribution is the insistence of individualization of orthoptic procedures for each patient. The first chapter deals with history, some visual physiology, amblyopia; chapters then follow on corrective procedures, esophoria, exophoria, vertical anomalies, orthoptics in strabismus, concomitant esotropia, monolateral exotropia, alternating strabismus, compound muscle anomalies, anomalies of reading, etc. The appendix contains case reports in great detail and the glossary shows that there are many terms which mean different things to the ophthalmologist and optometrist.

There are several examples of either illogical thinking, or careless writing when statements are made to the effect that "orthoptics will help a two-year-old child," that "it is hoped that myopia can be helped by exercises," and that "hyperphoria and hypophoria, unless alternating, are confined to either one eye or both, whereas esophoria and exophoria are in all instances binocular anomalies"; but these are minor notes.

Reading and studying this book with a questioning spirit will be most worthwhile. May this book also influence greatly the further development of integrity by the optometrists!

Recent Advances in Physiology. By W. H. Newton, M.D., Professor of Physiology in the University of Edinburgh. 268 pages, illustrated. Philadelphia: The Blakiston Company.

In reviewing the recent advances in physiology Dr. Newton has selected those topics which he feels lead the student into trends of modern thought. He says that this endeavor represents "some recent advances of some physiologists."

The book is definitely for the student of physiology. However, due to the interesting style of the old school writer, anyone can gainfully review its pages.

In text the review gives an explanatory background for such important new concepts of temperature regulation, kidney function, cardiac output, electrical excitation of nerve and special senses function.

Physiology of Heat Regulation and the Science of Clothing. Edited by L. H. Newburgh, M.D., Professor of Clinical Investigation, The Medical School, University of Michigan. 457 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1949. Price $7.50.

Only since the beginning of World War II has there been an attempt to define precisely the effects of the many variables of the environment on physiologic mechanisms. To protect soldiers exposed to climatic hazards it was necessary to obtain exact information concerning the physiologic adjustments which are made under these extremes. This book contains that information. It was written by many authors, some of whom are civilian research workers and others who are, or were, members of various governmental research laboratories. Much of the material presented is not easily available in original reports.

Following an interesting first chapter concerning the ways in which non-European peoples are adapted to adverse climates, there is a thorough discussion of body temperature, its regulation, and responses under extremes of heat and cold.

Clothing is then discussed as a thermal barrier. Much experimental data, collected both in the laboratory and in the field, which details the efficiency of various types of clothing in providing protection against extremes of environment are included.

In addition to being of interest to physicians and especially armed forces medical personnel, this book should be of value to heating and ventilating engineers as well as to those concerned with the development of new clothing fabrics.

Electrotherapy and Actinotherapy. By E. B. Clayton, M.B., B.Ch. (Cantab.), Consulting Physician to the Physical Treatment Department, King's College Hospital, London. 460 pages, with some illustrations. Baltimore: The Williams and Wilkins Company, 1949. Price $3.00.

The book is interesting from the viewpoint of an American physiatrist since some of the modalities described in its pages are wholly or partially forgotten technics in the daily practice of most of the physicians in the United States. However a few specialists are still employing the conventional type of diathermy and the vacuum glass electrodes. The chapter on Oudin current, long wave diathermy (the conventional type) and vacuum glass electrodes, is well presented, especially the necessary precautions to be observed.

Almost one-third of the work is devoted to the physics of electricity which is a little too lengthy, especially when the book is written for physical therapy students.

The author's dosage for soothing current, less than one ma. per square inch of the pad, is worthwhile to consider. Many will not agree with his bactericidal effect of electric current as employed in the treatment of infections. The counter-irritating doses of ultraviolet rays and constant current are stressed a little too far in the management of certain pathologic conditions such as arthritis.

For American students a glossary should be included in the book to clarify British terminology.

Essentials of Ophthalmology. By Roland I. Pritikin, M.D., F.A.C.S., F.I.C.S., Eye Surgeon, Rockford Memorial, Winnebago County and Swedish-American Hospitals. 561 pages, with 215 illustrations, some in color. Philadelphia: J. B. Lippincott Company, 1950. Price $7.50.

This is a good reference handbook for the medical student or general practitioner, but too brief for an ophthalmologist. The author has condensed the material very well. His chapters on (1) Industrial Ophthalmology and (2) Anomalies and Ocular Manifestations of General Diseases are exceptionally good for this type volume.

Symposium on Nutrition of the Robert Gould Research Foundation. Volume I. Nutritional Anemia. Edited by Arthur Lejwa. 194 pages. Cincinnati, Ohio: The Robert Gould Research Foundation, Inc.

Eleven eminent specialists combine papers on their particular branch of research in the field of nutritional anemia to produce this small volume. The clinical aspects of this phase of anemia are presented along with detailed discussions of the chemical and physiological approaches. An extensive amount of research, both animal and human, is evaluated in an effort to bring the reader the latest from many of the leading hematological laboratories. Where divided opinion still exists on controversial matters, such as the role of vitamin C in anemia, this fact is clearly admitted with evidence from both sides presented. This book will hold the interest of any engaged in the study of nutritional anemia, especially from the research angles. The nutritional chemist and hematologist, in particular, will profit from this first-hand store of authentic knowledge.

A Manual of the Penicillia. By Kenneth B. Raper, Principal Microbiologist, Fermentation Division, Northern Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture, Peoria, Illinois; and Charles Thom, Collaborator, U. S. Department of Agriculture, Peoria, Illinois. With the Technical Assistance and Illustrations by Dorothy I. Fennel, Assistant Microbiologist, National Science Fund and Cooperative Agent, U. S. Department of Agriculture, Peoria, Illinois. 873 pages, with illustrations. Baltimore: The Williams and Wilkins Company, 1949. Price $12.00.

This work is a detailed study of bibliography and a thorough and systematic study of some 2,000 new strains of penicillin in addition to at least as many more of the authors' own original collection.

Chapter I presents the historical development and study of this species. In Chapter II, generic diagnoses and synonyms are considered in detail. In Chapter III, methods of observing and a detailed description of penicillia are outlined. Methods of culture, preparation of suitable media and preservation are given in Chapter IV. Chapter V deals essentially with penicillin, its discovery, methods of production, assay, chemistry and the enzyme penicillinase elaborated by this organism. The clinical application of penicillin as a therapeutic agent in medicine is considered, followed by a list of various infectious processes against which it may be used and the limitations in the use of this antibiotic in various diseases.

Part II, consisting of 597 pages, is the manual proper dealing with occurrence, significance and identity of various species.

Part III contains a chapter on topical bibliography in which some 645 references are listed. There is a chapter on general bibliography containing approximately 798 references, followed by one containing a check list of species and general listing of approximately 686 references.

The photographic figures in black and white and the colored plates add to the exceptional value of this manual as a guide to the identity of this genera and the species contained therein.

It is a valuable and indispensible manual for bacteriologists, pharmacists, chemists and the chemical engineer whose interest and activities deal with this large group of micro-organisms.

Nutrition in Ophthalmology. By John J. Stern, M.D. 137 pages. New York: The National Vitamin Foundation, Inc., 1950. Price $1.50.

The author has compiled an excellent volume on Nutrition in Ophthalmology. He presents the subject in three chapters: (1) conjunctiva, cornea, and sclera; (2) lens and aqueous; and (3) retina, optic nerve, and visual act. Each chapter includes a discussion of the different vitamins and amino acid deficiencies, their signs and symptoms, differential diagnosis, pathology, prevalence, and treatment.

Southern Medical News

ALABAMA

The Medical College of Alabama, Birmingham, and the Jefferson County Health Department have received a special control grant of $11,000 from the National Cancer Institute, to do work on the effects of malignancy on the synthesis of heme enzymes and hemoglobin. This is one of 17 grants of the Institute, which total $324,525. Dr. Joseph C. Cline is the project director.

Dr. Walter Haynes, neurosurgeon, and Dr. Ralph Terhune, orthopedic surgeon, both of Birmingham, recently returned from Monterrey, Mexico, where they presented a series of lectures and demonstrations to the faculty and students of the University of Neuva Leon Medical School. Dr. J. C. Serrota, Birmingham, accompanied them as interpreter.

Dr. Garrold H. Nungesser, Decatur, has been chosen chairman of "Heart Week," which will be observed by the Morgan County Heart Society in February. Dr. W. H. Block, Hartselle, is associate president. Other officers are Dr. Kermit Pitt, Decatur, vice-president; Mrs. Wallace Meadows, Decatur, secretary; Mr. J. W. Darrah, treasurer; and Dr. J. C. Nash, Huntsville, program director.

Dr. Charles Thuss, Birmingham, has entered the Army with the rank of Lieutenant Colonel. He has been assigned to the Valley Forge Hospital in Pennsylvania, where he will do work in plastic surgery.

Dr. John Shamblin, Birmingham, regimental surgeon of the Dixie Division, is at Fort Jackson, South Carolina, with the division.

ARKANSAS

Third Annual Neuropsychiatric meeting will be held at North Little Rock, Veterans Administration Hospital, March 1 and 2, as announced by the Manager, Dr. Harold W. Sterling. Nationally known physicians will participate in the program. There is no registration charge. Further information may be obtained from

MEDICAL NEWS continued on page 48

SOUTHERN MEDICAL ASSOCIATION

Minutes* of Forty-Fourth Annual Meeting

St. Louis, Missouri, November 13-16, 1950

GENERAL SESSION

Monday, November 13, 9:15 a.m.

A General Session was held at the Kiel Municipal Auditorium, Opera House, St. Louis, Missouri, Dr. Hamilton W. McKay, President, Southern Medical Association, presiding.

Rev. George A. Bowles, Chaplain, Barnes Hospital, Washington University School of Medicine, St. Louis, Missouri, delivered the invocation.

Dr. Armand D. Fries, President, St. Louis Medical Society, St. Louis, Missouri, delivered an Address of Welcome for the Society.

Dr. Oscar B. Hunter, Immediate Past President, Southern Medical Association, Washington, D. C., responded to the Address of Welcome for the Southern Medical Association.

Immediately following the General Session there was a General Clinical Session.

GENERAL SESSION

Tuesday, November 14, 4:30 p.m.

A General Session was held at the Kiel Municipal Auditorium, Opera House, St. Louis, Missouri, Dr. Hamilton W. McKay, President, presiding.

The Southern Medical Association's Research Medal was presented to Dr. Guy L. Hunner, Baltimore, Maryland, "for clarifying the relationship of focal infections as disease producers in the genito-urinary tract, and especially for his constructive work on the diagnosis and treatment of the medical and surgical diseases of the urinary tract," the presentation being made by the President, Dr. McKay, with appropriate remarks by Dr. Hunner in accepting the medal.

In the Report of the Council last year there was an amendment to Article 2 (Purpose) of the Constitution, this to be up for final action this year. The President presented this amendment:

> "The purpose of this Association shall be to foster and develop scientific medicine, this to include medical education and all the economic phases of medicine. It shall have no direct connection with, or control over, any other society or organization, nor shall it at any time be controlled by any other society or organization. The Association shall not at any time take active part in any sectarian or partisan political movements. All meetings of the Association shall be for the purpose of presenting and discussing papers pertaining to the science of medicine, medical education, public health, and the various economic phases of the practice of medicine."

Upon motion, duly seconded, this amendment was approved without a dissenting vote.

The President, Dr. McKay, called upon Dr. W. L. Pressly, Chairman of the Council, Due West, South Carolina, to report for the Council. It was moved, duly seconded and carried without a dissenting vote, that since the Report of the Council would be printed in full in the JOURNAL, that reading of the report be omitted and approved as prepared by the chairman. (Full Council Report in a subsequent issue of the JOURNAL.)

The President, Dr. McKay, called upon the Chairman of the Council, as Chairman of the Nominating Committee, to present the Report of the Committee:

*Additional Minutes, such as Report of Council and other reports, Minutes of General Clinical Sessions, Sections, Conjoint Meetings and Woman's Auxiliary, will appear in subsequent issues of the JOURNAL.

The Council, as your Nominating Committee, presents for your consideration the following:

For President-Elect: Dr. R. J. Wilkinson, Huntington, West Virginia.

For First Vice-President: Dr. Walter C. Jones, Miami, Florida.

For Second Vice-President: Dr. Edwin C. Ernst, St. Louis, Missouri.

(No nomination for Editor and Assistant Editor and Secretary-Manager. The Editor and Assistant Editor were elected last year for a term of five years and the Secretary-Manager was elected three years ago for a term of five years.)

Motion was made, duly seconded and carried without a dissenting vote, that the report of the Nominating Committee be accepted and the nominees be elected by acclamation. The President, Dr. McKay then presented each of the newly elected officers.

Dr. Curtice Rosser, President-Elect and incoming President, Dallas, Texas, was then duly installed President of the Southern Medical Association, effective at the close of this annual meeting.

Dr. W. L. Pressly, Chairman of the Council, presented the Past President's Medal to Dr. Hamilton W. McKay, retiring President.

After announcements, the General Session adjourned, and with the completion of the program on Thursday, the 1950 annual session of the Association adjourned.

ENTERTAINMENT

The entertainment feature for physicians and ladies attending the St. Louis meeting was a dinner on Tuesday evening, November 14, 7:30 p.m. at the Jefferson Hotel, Gold Room, with the President, Dr. Hamilton W. McKay, Charlotte, North Carolina, presiding. Invocation was given by Rev. Edward T. Foote, S.J., Regent, St. Louis University School of Medicine, St. Louis. Following the dinner there was a dance in the Ivory Room. Dr. Victor E. Scherman, St. Louis, was Chairman of the committee arranging for this entertainment. This was an evening of fun and good fellowship with an outstanding program.

Preceding the dinner there was a radio program in the Ivory Room which was broadcast from New York, "Cavalcade of America," dramatizing the life story of Dr. J. Marion Sims, based upon the book "Woman's Surgeon" by Dr. Seale Harris, a past President of the Southern Medical Association, Birmingham, Alabama.

WOMEN PHYSICIANS

The thirty-sixth annual meeting and dinner for Women Physicians of the Southern Medical Association was held at St. Louis, Wednesday, November 15, 7:30 p.m., at the Jefferson Hotel, Private Dining Room No. 7. Dr. Mary E. Morris, President of the St. Louis Women Physicians Club, St. Louis, introduced the Chairman, Dr. Ruth G. Aleman, New Orleans, Louisiana, who presided. Twenty-six women physicians were present.

Dr. Ellen S. Loeffel, St. Louis, spoke on "The History of Medical Women of St. Louis."

Dr. M. Eleanor Cook of Lake Charles, Louisiana, was elected Chairman; and Dr. Amey Chappel of Atlanta, Georgia, Vice-Chairman.

Dr. Grace S. Mountjoy was Chairman of the Committee for Women Physicians, and associated with her were Dr. Grace E. Bergner, Dr. Joan M. Goebel and Dr. Mary E. Morris, all of St. Louis.

SCIENTIFIC AWARDS

The Committee on Scientific Awards presented the following report:

Your Committee on Scientific Awards visited the scientific exhibits and, after studying the exhibits, makes the following report:

First award to James M. Carlisle, Augustus Gibson, Stephen Fromer and Charles E. Lyght, Rahway, New Jersey, for their exhibit on cortisone (Compound E): pharmacology and clinical use.

Second award to St. Louis University School of Medicine, *Cardiovascular Exhibit*, Departments of Medicine, Pathology, Pediatrics, Radiology, Surgery and Anatomy, St. Louis, Missouri, for the exhibit on (I) congenital heart disease studies: Pathological, Vincent Moragues; Clinical, Chester P. Lynxwiler, Sidney Smith and John J. Inkley; (II) cardiac radiological studies: Don C. Weir, Charles J. Cherre and Armand E. Brodeur; and (III) neurocirculatory studies: Anatomical, Albert Kuntz, Kermit Christensen, William F. Alexander, Calvin A. Richins, Philip A. Conrath and Elizabeth Lewis; Clinical, James B. Stubbs and Robert Dean Woolsey.

Third award to Herbert C. Allen, Jr., Raymond L. Libby, Benedict Cassen and William E. Goodwin, Wadsworth Veterans Administration Hospital and University of California School of Medicine at Los Angeles, California, for their exhibit on the scintillation counter: a new diagnostic instrument.

Honorable mention to:

R. H. Rigdon, University of Texas Medical Branch, Galveston, Texas, for his exhibit on some complications accompanying streptomycin treatment of tuberculous meningitis.

Thomas G. Hull, American Medical Association, Chicago, Illinois, for his exhibit on brucellosis.

A. I. Lansing, T. B. Rosenthal and M. Alex, Washington University School of Medicine, St. Louis, Missouri, for their exhibit on aging and arteriosclerosis.

(Signed) HELEN GLADYS KAIN, *Chairman*,
H. R. PRATT-THOMAS
ARTHUR J. SCHWERTMAN
DONALD W. SMITH
VINCENT W. ARCHER
Committee.

The Committee on Scientific Awards consists of five members of the Association, appointed by the Chairman of the Council, one to represent pathology, one medicine, one surgery and two at large, one member to be a member of the Council who shall be chairman of the Committee.

GOLF TOURNAMENT

Dr. Cecil M. Charles, Chairman of Golf Committee, St. Louis, Missouri, makes the following report for his Committee:

The twenty-seventh annual golf tournament for physicians of the Southern Medical Association was held on Tuesday and Wednesday, November 14 and 15, at the Algonquin Golf Club, 340 North Berry Road, Glendale, St. Louis County, Missouri.

Dr. Simon A. Levey, St. Louis, Missouri, won the *Dallas Morning News* Cup, handicap for low net.

Dr. Harold P. McDonald, Atlanta, Georgia, won the *Oklahoman* and *Times* Cup, for low gross score, junior class, for the second year, also having won it in 1949.

Dr. Irl R. Davis, St. Louis, Missouri, won the Ralston Purina Cup for low gross score, senior class.

The *Oklahoman* and *Times Cup*, and the *Dallas Morning News* Cup and the Ralston Purina Cup must be won three times by the same golfer to become the permanent possession of a contestant. As none of the trophies have been won three times, they will all be in play next year.

(Signed) CECIL M. CHARLES, *Chairman.*

TRAP AND SKEET SHOOTING TOURNAMENT

The usual annual Trap and Skeet Shooting Tournament of the Southern Medical Association was not held at St. Louis. Due to unusual conditions it was thought best to omit a shoot at the St. Louis meeting, and with the approval of the Council it was omitted. The trophies won in the shoot last year will be held by the shooters who won them until there is another shoot at an annual meeting.

REGISTRATION

St. Louis Meeting, Southern Medical Association
November 13-16, 1950

	Number Physicians	Number Ladies Accompanying Physicians
Alabama	71	37
Arkansas	56	32
District of Columbia	20	7
Florida	41	17
Georgia	66	26
Kentucky	74	30
Louisiana	58	25
Maryland	33	11
Mississippi	34	22
Missouri (Outside of St. Louis)	260	100
St. Louis	726	—
North Carolina	63	16
Oklahoma	47	29
South Carolina	21	6
Tennessee	102	49
Texas	88	44
Virginia	43	11
West Virginia	22	10
Other States and Foreign	292	73
Total Physicians	2,117	545
Medical Students	472	
Nurses	74	
Technicians	18	
Technical Exhibitors	323	
Miscellaneous	99	
	3,103	
Ladies	545	
Grand Total	3,648	

These figures are compiled from the card registration. There are always a number of physicians attending who neglect to register, especially where no attendance fee is charged as was the case at St. Louis. Under such circumstances the number attending who fail to register is variously estimated from 3 to 10 per cent of the total registration. It is believed that at least 5 per cent of the physicians who attended the St. Louis meeting failed to register, and if this is true, an additional 105 physicians should be added to the 2,117 who did register, making the actual attendance at least 2,222 physicians, with a grand total of 3,753.

SCIENTIFIC AND TECHNICAL EXHIBITS

Kiel Municipal Auditorium

The Scientific and Technical Exhibits in connection with the forty-fourth annual meeting of the Southern Medical Association were placed at the Kiel Municipal Auditorium, St. Louis, and were open on Monday, Tuesday, Wednesday and Thursday, November 13-16, from 8:00 a.m. to 6:00 p.m.

There were sixty-six (66) Scientific Exhibits, representing all phases of medicine and surgery, many of them being original research work. The Scientific Exhibits were conveniently placed and arranged so they could be easily seen and studied. See below complete list of Scientific Exhibits.

In the Technical Exhibits there were seventy-three (73) business firms with a total of ninety-four (94) exhibit spaces. The Technical Exhibits were made up of firms that had something a physician needed and could use in the actual practice of medicine. The Technical Exhibits at the Southern Medical Association meeting have a scientific value. See page 176 for complete list of business firms.

SCIENTIFIC EXHIBITS

Kiel Municipal Auditorium

The following were the Scientific Exhibits at the St. Louis meeting (the number at the left is the space number and corresponds to the numbers in circles on the diagram on page 177).

Medicine

1. Malcolm B. Bawell, Clement B. Grebel and Francis Murry, St. Louis University School of Medicine, St. Louis, Mo.: The Poliomyelitis Epidemics of St. Louis City and County in 1946 and 1949.

Pediatrics

2. William A. Reilly, University of Arkansas School of Medicine, Little Rock, Ark.: Endocrine Problems in Childhood.

Medicine

3. R. H. Rigdon, University of Texas Medical Branch, Galveston, Tex.: Some Complications Accompanying Streptomycin Treatment of Tuberculous Meningitis.

4. Charles W. Hock, Medical College of Georgia, Augustus, Ga.: Bentyl Hydrochloride: A New Antispasmodic.

5. Joseph V. Finnegan, Bray O. Hawk, George E. Thoma and John J. Inkley, St. Louis University School of Medicine, St. Louis, Mo.: Bolen and Huggins Tests, Sedimentation Rate, and Weltmann Band in Cancer.

6. Louis I. Dublin and Earl C. Bonnett, Metropolitan Life Insurance Company, New York, N. Y.: Studies in Prognosis.

7. Hyman J. Goldman and E. Lawrence Keyes, St. Louis University School of Medicine, St. Louis, Mo.: Illustration of a Common Type of Cancer.

Radiology

8. Jesshill Love, G. N. Combs, W. A. Askew and M. Harcourt, Louisville, Ky.: A Method for Improving Depth Dose Distribution: Body Cross Sectional Diagrams in X-ray Therapy.

Anesthesiology

9. John Adriani and O. F. Bush, Louisiana State University School of Medicine, New Orleans, La.: Spinal Anesthesia for Cesarean Section.

Urology

10. W. F. Melick and J. E. Byrne, St. Louis University School of Medicine, St. Louis, Mo.: Perineal Prostatic Biopsy: Demonstration of New Needle and Results.

Medicine

11. Joseph C. Edwards, Washington University School of Medicine, St. Louis, Mo.: Electrocardiographic Diagnosis of Obscure Myocardial Lesions.

Neurology and Psychiatry

12. Averill Stowell and Robert A. Hayne, Tulsa, Okla.: The Diagnosis and Treatment of Cerebral Atrophy in the Child and Adult.

13. Leland B. Alford, St. Louis, Mo.: A Hidden Reaction Around Cerebral Lesions.

Medicine

14. Thomas G. Hull, American Medical Association, Chicago, Ill.: Brucellosis.

15. Herbert C. Allen, Jr., Raymond L. Libby, Benedict Cassen and William E. Goodwin, Wadsworth Veterans Administration Hospital and University of California School of Medicine at Los Angeles, Los Angeles, Calif.: The Scintillation Counter: A New Diagnostic Instrument.

Gastroenterology

16. Milford O. Rouse, Cecil O. Patterson, Victor I. Lyday and William S. Reynolds, Southwestern Medical School of the University of Texas, Dallas, Tex.: A Practical Code for Cross-Indexing Gastro-intestinal X-ray Films and Charts for Teaching Purposes.

Dermatology

17. Richard S. Weiss and Seth S. Barnes, Washington University School of Medicine and Barnard Free Skin and Cancer Hospital, St. Louis, Mo.: The *In Vitro* Test for Disseminated Lupus Erythematosus.

18. Francis A. Ellis and William R. Bundick, University of Maryland School of Medicine, Baltimore, Md.: Lupus Erythematosus: Classification and Value of Biopsy in Diagnosis and Prognosis.

19. E. N. Walsh and Charles Phillips, Temple, Tex.: Sunlight and the "Cancer Skin."

20. U. S. Public Health Service, Communicable Disease Center, Mycology Unit, Atlanta, Ga.: Agents of Tinea Capitis in the United States.

Radiology

21. Edwin C. Ernst, Barnard Free Skin and Cancer Hospital and De Paul Hospital, St. Louis, Mo.: Cancer of Cervix Uteri: Radiation Therapy Results with Improved Expanding Type of Radium Applicator.

22. John C. Glenn, Jr. and Allen Taylor, Duke University School of Medicine, Durham, N. C.: Tumors of the Jaws.

23. James O. Hoppe, Sydney Archer and John W. Hart, Sterling-Winthrop Research Institute, Rensselaer, N. Y.: New Radiographic Contrast Media.

24. Otto H. Grunow and Lauren V. Ackerman, Washington University School of Medicine, St. Louis, Mo.: Radiating Spicules: A Nonspecific Manifestation of Bone Disease.

Pathology

25. William H. Bauer, Leroy Sante and R. M. O'Brien, St. Louis University Schools of Medicine and Dentistry, St. Louis, Mo.: Diseases of Bones.

26. J. William Thompson and Edward L. Miloslavich, De Paul Hospital, St. Louis, Mo.: Surgical Pathology of the Gastrointestinal Tract.

27. Armed Forces Institute of Pathology, Washington, D. C.: Armed Forces Institute of Pathology.

Medicine

28. Department of the Army, Office of the Surgeon General, Preventive Medicine Division, Washington, D. C.: Prevention of Rheumatic Fever.

29. Victor M. Sborov and Donald A. Sutherland, Department of Hepatic and Metabolic Disease, Army Medical Department, Research and Graduate School, Washington, D. C.: Liver Biopsy in Chronic Hepatic Disease.

Surgery

30. William W. Chase and William H. Ferguson, Garfield Memorial Hospital, Washington, D. C.: Surgery of Gastric Lesions.

Gynecology

31. Karl John Karnaky, Baylor University College of Medicine, Houston, Tex.: Practical Office Gynecology.

32. H. E. Nieburgs, Medical College of Georgia, Augusta, Ga.: The Role of Hormones in Carcinogenesis and Therapy.

Surgery

33. Robert W. Bartlett, Washington University School of Medicine, St. Louis, Mo.: Carcinoma of the Colon and Rectum.

Gynecology

34. Archibald Perrin Hudgins, Charleston, West Va.: Relief of Postoperative Perineal Pain.

Surgery

35. Willard Bartlett, Jr. and George E. Thoma, St. Louis University School of Medicine, St. Louis, Mo.: The "Total" Attack upon Thyroid Cancer.

36. William R. Sandusky, University of Virginia School of Medicine, Charlottesville, Va.: Antibiotics in Experimental Gas Gangrene.

37. Charles F. Sherwin, St. Louis University School of Medicine and Barnard Free Skin and Cancer Hospital, St. Louis, Mo.: Types of Tumors Suitable for Treatment by the General Practitioner.

Medicine

38. Goronwy O. Broun and Sister M. Leo Rita Volk, St. Louis University School of Medicine, St. Louis, Mo.: The Differential Count of Bone Marrow.

Orthopedic and Traumatic Surgery

39. Maurice B. Roche, Frederick A. Jostes and Roland F. Neumann, Veterans Administration Hospital, Jefferson Barracks, St. Louis, Mo.: A Simple Surgical Technic for the Treatment of Nonunion.

40. George R. Rowe and Maurice B. Roche, Washington University School of Medicine, St. Louis, Mo.: The Separate Neural Arch: A Study of Incidence from the Fetus to Maturity.

Surgery

41. Robert Dean Woolsey and George E. Thoma, St. Louis University School of Medicine, St. Louis, Mo.: Radioactive Diiodofluorescein in the Localization of Brain Tumors.

42. Bray O. Hawk and E. Lawrence Keyes, St. Louis University School of Medicine, St. Louis, Mo.: The Clinical Findings Early in Acute Appendicitis.

Orthopedic and Traumatic Surgery

43. William Kenney Massie, Jr., Lexington, Ky., and M. Beckett Howorth, New York, N. Y.: Congenital Dislocation of the Hip.

Surgery

44. John W. Devine, John W. Devine, Jr. and Stanley Burwell, Lynchburg, Va.: The Surgical Treatment of Carcinoma of the Stomach and Pancreas.

Gynecology

45. William Bickers, Richmond, Va.: Premenstrual Tension.

Surgery

46. C. Frank Chunn, Tampa Municipal Hospital and St. Joseph's Hospital, Tampa, Fla.: Carcinoma of the Esophagus.

Ophthalmology

47. Aeleta N. Barber and Nicholas Gagliano, Louisiana State University School of Medicine, New Orleans, La.: Some Ocular Manifestations of General Pathology.

Surgery

48. James F. Dowd, St. Louis University Schools of Medicine and Dentistry, St. Louis, Mo.: Plastic Surgical Reconstruction of Cleft of Upper Lip.

Otolaryngology

49. James B. Costen, Washington University School of Medicine, St. Louis, Mo.: Morphology of Laryngeal Tumors.

50. A. C. Stutsman, Washington University School of Medicine, St. Louis, Mo.: Technic of Tracheotomy.

51. Lucian White Alexander, Tulane University School of Medicine, New Orleans, La.: Stages of the Fenestration Operation in Detail.

52. J. Brown Farrior, Richard A. Bagby and G. H. Schoetker, Tampa Municipal Hospital, Tampa, Fla.: Cancer of Head and Neck.

Ophthalmology

53. Franklin M. Foote, Willis S. Knighton and Virginia Smith Boyce, National Society for the Prevention of Blindness, New York, N. Y.: Diagnosis and Treatment of Glaucoma.

54. Alston Callahan and Mary Nicholl, Medical College of Alabama, Birmingham, Ala.: The Surgery of Glaucoma.

Physical Medicine and Rehabilitation

55. Florence I. Mahoney and A. V. Isherwood, Kennedy Veterans Administration Hospital, Memphis, Tenn.: The Treatment of Spinal Cord Injury Patient.

56. Sedgwick Mead and Emily E. Mueller, Washington University School of Medicine, St. Louis, Mo.: Electrically Heated Hot Packs.

Medicine

57. Clement J. Sullivan, Vincent Moragues and George E. Thoma, St. Louis University School of Medicine, St. Louis, Mo.: Development of Experimental Collagen Disease.

58. R. W. Cunningham, B. K. Harned, J. J. Denton and G. W. Clark, Lederle Laboratories Division, American Cyanamid Company, New York, N. Y.: Studies on Artane: Pharmacological and Clinical.

59. A. I. Lansing, T. B. Rosenthal and M. Alex, Washington University School of Medicine, St. Louis, Mo.: Aging and Arteriosclerosis.

Surgery

60. Jacob J. Weinstein, George Washington University School of Medicine and Gallinger Municipal Hospital, Washington, D. C.: Parenteral Carbohydrate Therapy: Use of Invert Sugar.

Medicine

61. St. Louis University School of Medicine, *Cardiovascular Exhibit*, Departments of Medicine, Pathology, Pediatrics, Radiology, Surgery and Anatomy, St. Louis, Mo.: (I) *Congenital Heart Disease Studies*: Pathological, Vincent Moragues; Clinical, Chester P. Lynxwiler, Sidney Smith and John J. Inkley. (II) *Cardiac Radiological Studies*: Don C. Weir. Charles J. Cherre and Armand E. Brodeur. (III) *Neurocirculatory Studies*: Anatomical, Albert Kuntz, Kermit Christensen, William F. Alexander, Calvin A. Richins, Philip A. Conrath and Elizabeth Lewis; Clinical, James B. Stubbs and Robert Dean Woolsey.

Orthopedic and Traumatic Surgery

62. J. Leonard Goldner, Duke University School of Medicine, Durham, N. C.: Prevention and Correction of Hand Deformities Following Trauma.

Surgery

63. James Barrett Brown, Frank McDowell and Minot P. Fryer, Washington University School of Medicine, St. Louis, Mo.: Plastic Surgery Repair of Radiation Lesions Including Those of Atomic Origin, and Prevention of Chronic Lesions.

Orthopedic and Traumatic Surgery

64. R. M. O'Brien and Don C. Weir, St. Louis University School of Medicine, St. Louis, Mo.: Low Back Pain.

Medicine

65. James M. Carlisle, Augustus Gibson, Stephen Fromer and Charles E. Lyght, Merck and Company, Inc., Rahway, N. J.: Cortisone (Compound E): Pharmacology and Clinical Use.

66. U. S. Atomic Energy Commission, Isotopes Division, Oak Ridge, Tenn.: Radioisotopes in Medicine.

MOTION PICTURES

Kiel Municipal Auditorium

Wednesday and Thursday

As part of the St. Louis meeting there were motion pictures running continuously on Wednesday and Thursday, November 15 and 16, 8:30 a.m. to 5:30 p.m., with request periods at specified times.

"Fenestration for Clinical Otosclerosis," Lucian White Alexander, Tulane University School of Medicine, New Orleans, La.

"The Window Laryngo-fissure Operation for Early Malignant Growths of the Larynx," Edwin N. Broyles, Johns Hopkins University School of Medicine, Baltimore, Md.

"Technic of Laryngectomy for Carcinoma of Larynx," Charles F. Sherwin, St. Louis University Hospitals, St. Louis, Mo.

"Plastic Surgical Reconstruction of Cleft of the Upper Lip," James F. Dowd, St. Louis University Schools of Medicine and Dentistry, St. Louis, Mo.

"Trigeminal Neuralgia," Robert Dean Woolsey, St. Louis University School of Medicine, St. Louis, Mo.

"Vaginal Hysterectomy," Olin S. Cofer and Albert L. Evans, Atlanta, Ga.

"Trichomonas Vaginalis and Leukorrhea," Karl John Karnaky, Baylor University College of Medicine, Houston, Tex.

"Uterine Cancer: Pathogenesis Detection and Diagnosis," H. E. Nieburgs, E. R. Pund and S. Bamford, Medical College of Georgia, Augusta, Ga.

"Newer Drug Therapy of Parkinson's Disease," Joseph C. Edwards, Washington University School of Medicine, St. Louis, Mo.

"Be Your Age," Donald B. Armstrong, Metropolitan Life Insurance Company, New York, N. Y.

"Cataract Extraction: Wound Closure," Bennett Y. Alvis and Edmund B. Alvis, Washington University School of Medicine, St. Louis, Mo.

"Restoration of Lids and Brow After Massive Trauma: Immediate Repair," Alston Callahan, Medical College of Alabama, Birmingham, Ala.

"Decortication of the Unexpendable Pneumothorax Lung," David H. Waterman, Knoxville, Tenn.

"Plantar Neuroma," Lyon K. Loomis, New Orleans, La.

"Physiological Labor with Saddle Block Anesthesia for Delivery," Oren A. Ellingson, Tampa, Fla.

"Medical Effects of the Atomic Bomb," Department of the Army, Office of the Surgeon General, Washington, D. C.: I. "Physics, Physical Destruction and Casualty Effects." II. "Pathology and Clinical Problem." III. "Medical Services in Atomic Disaster."

TECHNICAL EXHIBITS

Kiel Municipal Auditorium

Here follow the names of business firms that had exhibits at the St. Louis meeting with their space number as shown on the diagram on next page.

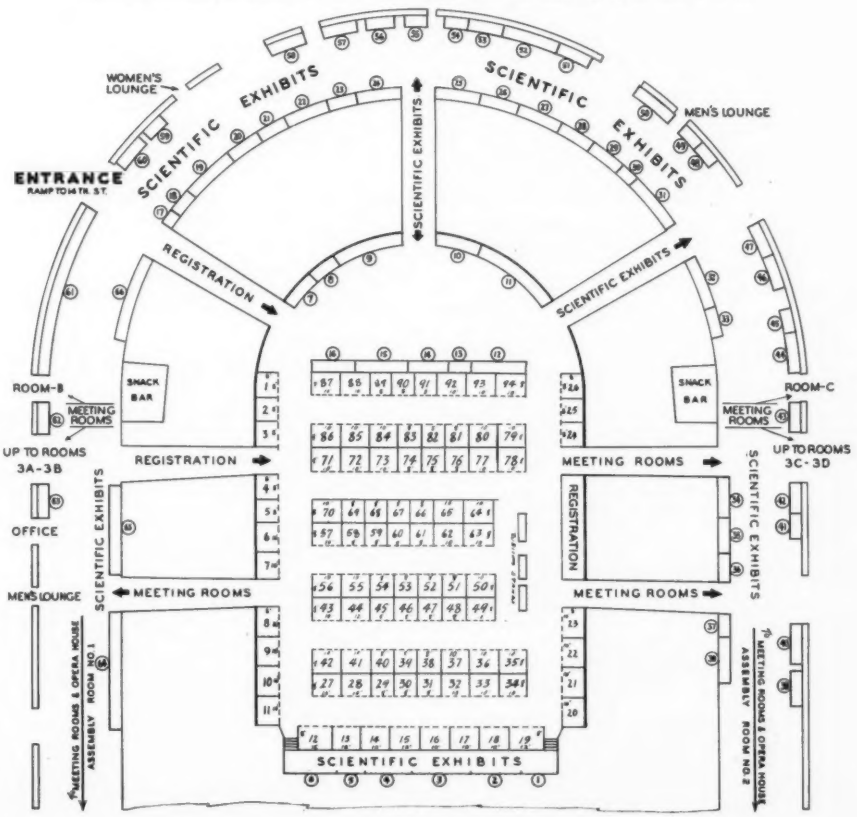
	Space No.
Abbott Laboratories, North Chicago, Ill.	8
Aloe Company, A. S., St. Louis, Mo.	35–37
American Hospital Supply Corporation, Evanston, Ill.	63
Ames Company, Inc., Elkhart, Ind.	47
Armour Laboratories, The, Chicago, Ill.	84
Ayerst, McKenna and Harrison, Ltd., New York, N. Y.	51
Bard-Parker Company, Inc., Danbury, Conn.	26
Bilhuber-Knoll Corporation, Orange, N. J.	39
Brayten Pharmaceutical Company, Chattanooga, Tenn.	33
Burroughs Wellcome & Company (U.S.A.) Inc., Tuckahoe, N. Y.	45
Carnation Company, Los Angeles, Calif.	31
Central Pharmacal Company, The, Seymour, Ind.	91
Cetylite Industries, Inc., Long Island City, N. Y.	30
Ciba Pharmaceutical Products, Inc., Summit, N. J.	88
Davis & Geck, Inc., Brooklyn, N. Y.	11
Doak Company, Inc., Cleveland, O.	2

Doho Chemical Corporation, The, New York, N. Y. 58–59
Duke Laboratories, Inc., Stamford, Conn. 82
Eastman Kodak Company, Rochester, N. Y. 41
Eaton Laboratories, Inc., Norwich, N. Y. 50, 57
Fischer and Company, H. G., Franklin Park, Ill. 80
General Electric X-Ray Corporation, Milwaukee, Wis. 18
Gradwohl Laboratories, St. Louis, Mo. 43–44
Gynecological Specialties, Alton, Ill. 25
Haskell & Company, Charles C., Richmond, Va. 5
Hoffman-La Roche, Inc., Nutley, N. J. 61
Irwin, Neisler and Company, Decatur, Ill. 34
Kremers-Urban Company, Milwaukee, Wis. 22
Lea and Febiger, Philadelphia, Pa. 53
Lederle Laboratories, Inc., New York, N. Y. 92–94
Lilly and Company, The Eli, Indianapolis, Ind. 71–73
Lippincott Company, J. B., Philadelphia, Pa. 67
M & R Dietetic Laboratories, Inc., Columbus, O. 55
Macmillan Company, The, New York, N. Y. 38
Majors Company, J. A., New Orleans, La. and Dallas, Tex. 86
Massengill Company, The S. E., Bristol, Tenn. 65
Mattern Manufacturing Company, F., Chicago, Ill. 6–7
Mead Johnson and Company, Evansville, Ind. 75–76
Medco Products Company, Tulsa, Okla. 17
Medical Aids Incorporated, Chicago, Ill. 40
Medical Bureau, The, Chicago, Ill. 3
Merck and Company, Inc., Rahway, N. J. 77–78
Merrell Company, The William S., Cincinnati, O. 74
Mosby Company, The C. V., St. Louis, Mo. 49
Nestle Company, Inc., The, Colorado Springs, Colo. 54
Parke, Davis and Company, Detroit, Mich. 13–16
Pet Milk Sales Corporation, St. Louis, Mo. 89–90
Pfizer & Company, Inc., Chas., Brooklyn, N. Y. 12
Pitman-Moore Company, Indianapolis, Ind. 48
Poythress and Company, Inc., William P., Richmond, Va. 81
Riker Laboratories, Inc., Los Angeles, Calif. 19
Robins Company, A. H., Richmond, Va. 56
Rystan Company, Inc., Mount Vernon, N. Y. 52
Sanborn Company, Cambridge, Mass. 60
Sandoz Chemical Works, Inc., New York, N. Y. 62
Saunders Company, W. B., Philadelphia, Pa. 85
Schenley Laboratories, Inc., New York, N. Y. 23
Schering Corporation, Bloomfield, N. J. 24
Searle and Company, G. D., Chicago, Ill. 64
Shampaine Company, St. Louis, Mo. 32
Sharp and Dohme, Inc., Philadelphia, Pa. 68–70
Smith, Kline & French Laboratories, Philadelphia, Pa. 79
Spencer, Incorporated, New Haven, Conn. 66
Squibb & Sons, E. R., New York, N. Y. 27–29
Upjohn Company, The, Kalamazoo, Mich. 83
U. S. Vitamin Corporation, New York, N. Y. 42
VanPelt & Brown, Inc., Richmond, Va. 9
Walker Vitamin Products, Inc., Mount Vernon, N. Y. 1
Wallace & Tiernan Products, Inc., Belleville, N. J. 10
Warner and Company, William R., New York, N. Y. 46
White Laboratories, Inc., Newark, N. J. 4
Winthrop-Stearns, Inc., New York, N. Y. 20–21
Wyeth, Incorporated, Philadelphia, Pa. 87

DIAGRAM, SCIENTIFIC AND TECHNICAL EXHIBITS

Kiel Municipal Auditorium, St. Louis, Missouri

Scientific Exhibits, Space Nos. 1 to 66 (in circles); Technical Exhibits, Space Nos. 1 to 94



OFFICERS

The following is a complete roster of the officers of the Southern Medical Association, and of organizations meeting conjointly, for 1950-1951.

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College of American Pathologists, Southeastern Section (meeting conjointly with Southern Medical Association)—Dr. Merlin L. Trumbull, Chairman, Memphis, Tenn.

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Continued from page 172

Dr. Ewin S. Chappell, Director of Professional Education, Veterans Administration Hospital, North Little Rock. This Veterans Administration Hospital was opened in 1921 and it will be observing its Thirtieth Anniversary Year at the time of this meeting and many former staff members are expected to return for the occasion.

Dr. A. S. Koenig, Fort Smith, has been appointed councilor for Arkansas, in the American Society of Clinical Pathologists.

Dr. J. J. Monfort, Batesville, has been elected chairman of the Arkansas Division of the American Cancer Society.

Dr. T. E. Buffington has been elected Mayor of Benton.

Dr Hayden C. Nicholson is Dean of the University of Arkansas School of Medicine, Little Rock.

Dr. Grover Poole has been elected chairman of the Jonesboro Board of Health, and Dr. P. W. Lutterloh has been elected to membership on the Board.

DISTRICT OF COLUMBIA

Dr. Oscar B. Hunter, Sr., Washington, has been appointed Administrative Head of the Medical Section of Civil Defense in the District of Columbia including the metropolitan area. In this capacity he will be in complete charge of the emergency medical care program in event of an attack or any wartime disasters befalling the nation's capital. Under his direction will be medical services in casualty stations and hospitals, the stockpiling of medical equipment and supplies, and the evacuation of the sick and injured. Dr. Hunter was nominated for this position by the Medical Society of the District of Columbia. His appointment was made official by the Board of Commissioners of the District of Columbia. Physicians who will serve under Dr. Hunter and their assignments are: Dr. W. Ross Morris, Assistant to Dr. Hunter; Dr. William D. Claudy, Chief of Emergency Medical Care Services; Dr. George W. Reeves, Assistant Chief of Emergency Medical Care Services; Dr. Alfred Brigulio, Chief of Hospitals; Dr. Luther Snyder, Assistant Chief of Hospitals; Dr. Cyrus H. Maxwell, Chief of Medical Evacuation; Dr. Lomax Wells, Assistant Chief of Medical Evacuation; Dr. A. Clagett Gray, Chief of Medical Resources; and Dr. Luther W. Gray, Assistant Chief of Medical Resources. By authority of the Commissioners the following Medical Advisory Committee has been appointed: Dr. Ralph B. Beachley, Dr. Walter Bloedorn, Dr. Leigh C. Fairbank, Dr. F. Royce Franzoni, Dr. William T. Grady, Dr. A. Clagett Gray, Dr. Joseph Johnson, Dr. John Sinclair Perry, Dr. Charles Stanley White, Dr. Wallace M. Yater, Dr. Mark V. Zeigler and Mr. Theodore Wiprud, Executive Director and Secretary of the Medical Society of the District of Columbia.

An exhibit in honor of Hermann von Helmholtz, inventor of the ophthalmoscope, was opened December 17 at the Armed Forces Medical Museum, Ninth and Independence Avenue, S.W., Washington. The exhibit, which commemorates the hundredth anniversary of the invention of the ophthalmoscope, will be continued approximately six months.

The Army Medical Service Research and Graduate School at the Army Medical Center, in cooperation with the consulting staff of the George Washington University, has set up an artery graft bank at the Walter Reed Army Hospital, Washington, available for use by other hospitals of the area. Human arteries, obtained from accident victims, are kept alive in a special solution for thirty days, and can be used for grafts where patients have suffered a severe injury to any large artery.

Colonel William L. Wilson has been approved as Assistant Director in Charge of Medical Care Services for Civil Defenses in the District of Columbia by the Executive Board of the District's Medical Society.

Drs. Harold Y. Finch, Morris I. Michael and Ralph Stiller, members of the Medical Society of the District of Columbia, have been elected to membership in the American Academy of Pediatrics.

Dr. Maurice Protas, Washington, has been appointed to the National Diabetes Detection Committee of the American Diabetes Association.

The Metropolitan Washington Tuberculosis Conference was held recently in Washington.

Dr. Brian Blades, Washington, Chief Consultant in Thoracic Surgery for the Veterans Administration, has been appointed to the Veterans Administration Special Medical Advisory Group.

Dr. John Minor, Washington, Assistant in Medicine at George Washington University School of Medicine and Past President of the Medical Society of the District of Columbia, was elected President of the American Clinical and Climatological Association at its annual meeting in Stockbridge, Massachusetts, recently.

Dr. Winfred Overholser, Superintendent of St. Elizabeths Hos-

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THE NEW YORK POLYCLINIC

MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America)

OBSTETRICS and GYNECOLOGY

A full-time course. In Obstetrics: lectures; prenatal clinics; witnessing normal and operative deliveries; operative obstetrics (manikin). In Gynecology: lectures; touch clinics; witnessing operations; examination of patients preoperatively; follow-up in wards postoperatively. Obstetrical and gynecological pathology. Anesthesia. Attendance at conferences in obstetrics and gynecology. Operative gynecology on the cadaver.

EYE, EAR, NOSE and THROAT

A three months combined full-time refresher course consisting of attendance at clinics, witnessing operations, lectures, demonstration of cases and cadaver demonstrations; operative eye, ear, nose and throat on the cadaver; clinical and cadaver demonstrations in bronchoscopy, laryngeal surgery and surgery for facial palsy; refraction; radiology; pathology, bacteriology and embryology; physiology; neuroanatomy; anesthesia; physical medicine; allergy; examination of patients preoperatively and follow-up postoperatively in the wards and clinics.

FOR THE GENERAL SURGEON

A combined surgical course comprising general surgery, traumatic surgery, abdominal surgery, gastroenterology, proctology, gynecological surgery, urological surgery. Attendance at lectures, witnessing operations, examination of patients preoperatively and postoperatively and follow-up in the wards postoperatively. Pathology, radiology, physical medicine, anesthesia. Cadaver demonstrations in surgical anatomy, thoracic surgery, proctology, orthopedics. Operative surgery and operative gynecology on the cadaver.

ANESTHESIA

A three months full-time course covering general and regional anesthesia, with special demonstrations in the clinics and on the cadaver of caudal, spinal, field blocks, etc.; instruction in intravenous anesthesia, oxygen therapy, resuscitation, aspiration bronchoscopy.

FOR INFORMATION ADDRESS

THE DEAN, 345 WEST 50TH STREET, NEW YORK 19, N. Y.

A New, Distinctive Synthetic ANTISPASMODIC

TROCINATE

HIGHLY POTENT . . . NON-TOXIC

DUAL ACTIVITY

X-ray, typical spastic gut

THE THIOL LINKAGE, **chemically incorporated for the first time in a synthetic antispasmodic drug, is responsible for the extremely high potency of Trocinate.**

X-Ray, typical normal gut

TROCINATE (Beta-diethylaminoethyl-diphenylthioacetate hydrochloride) offers in a single molecule *all* the advantages and *none* of the disadvantages of atropine and papaverine. Note these outstanding properties:

1. ***Strong musculotropic action***
2. ***Strong neurotropic action***
3. ***Non-narcotic***
4. ***Remarkably free from side-effects, low in toxicity***

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INDICATIONS: For the relief of smooth muscle spasm; as existing in pylorospasm, gastric hyperacidity, gastric or duodenal ulcer, gastritis, enteritis, colitis, irritable colon, biliary colic, biliary dyskinesia.

DOSAGE: Adults—one or two tablets, three or four times a day. (Swallow whole to avoid local anesthetic effect).

SUPPLIED: Trocinate (pink sugar-coated tablets) contains 100 mg. Trocinate.

Trocinate with phenobarbital (red sugar-coated tablets) contains 65 mg. Trocinate and 15 mg. phenobarbital. Available in bottles of 40 and 250 tablets.

POYTHRESS *Trocinate* **Beta-diethylaminoethyl-diphenylthioacetate hydrochloride**

mildly corrective
highly effective

Cholmodin

in constipation

Cholmodin (Brand) Tablets offer a rational approach to correction of habitual and atonic constipation because their action so closely resembles physiologic action. Specific but temperate effect on both colon and small intestine is *Cholmodin*'s great advantage:

mildly corrective

Soft, formed stools without griping or marked loss of water follow administration of *Cholmodin*. Dosage can gradually be reduced as improvement is noted.

highly effective

Cholmodin combines two corrective agents: Deoxycholic acid with a small amount (¾ gr.) of aloe. Extract of aloe yields emodin, specific stimulant of colonic activity. Deoxycholic acid increases motility in the small bowel and enhances the release and diffusion of emodin from the minimal amount of aloe.

well tolerated

Cholmodin Tablets may be prescribed during pregnancy, menstruation, and in the presence of hemorrhoids. *Cholmodin* Tablets are especially adapted for the aging patient.

how prescribed

In habitual constipation, one or two tablets daily after meals, for three or four days, then reduce dosage as improvement occurs; as an occasional corrective, one or two tablets on retiring. (Each tablet contains 1½ gr. (0.1 Gm.) deoxycholic acid and ¾ gr. (0.05 Gm.) extract of aloe.)

how supplied Bottles of 50 and 500 tablets

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A broad antimicrobial spectrum:

staphylococci
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Morax-Axenfeld diplobacillus
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E. coli
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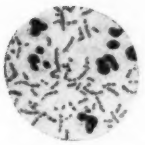

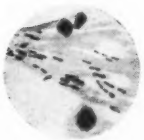

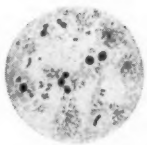

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A wide clinical range:

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corneal ulcer
epiphora secondary to conjunctival infection
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Terramycin
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for topical use only

Ophthalmic Ointment

A suspension of Crystalline Terramycin Hydrochloride in a petrolatum base. One Gm. of ointment provides 1 mg. of Terramycin. Available in tubes containing ⅛ oz.

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Terramycin
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Ophthalmic Solution

Supplied as a dry mixture of Crystalline Terramycin Hydrochloride and a sodium borate-sodium chloride buffer for preparation of topical solutions. Each 5 cc. vial provides 25 mg. of Terramycin to be dissolved in 5 cc. of Water for Injection, U.S.P. Solutions are isotonic with lacrimal fluid and buffered to pH 8.2.

In deep-seated and systemic infections, local treatment is recommended as an adjunct to oral Terramycin therapy.

Pfizer

Antibiotic Division
CHAS. PFIZER & CO., INC.
Brooklyn 6, N. Y.

Continued from page 48

pital, Washington, addressed the Royal Academy of Medicine of Barcelona, Spain, last October.

Dr. James Alexander Lyon, Washington, has been elected to the National Executive Committee of the Society of American Legion Founders.

Dr. Pearce Bailey, Washington, Chief of Neurology, Veterans Administration, and Dr. Francis M. Forster, Professor and Director of the Department of Neurology, Georgetown University School of Medicine, Washington, are on the editorial board of *Neurology*, a new journal of the American Academy of Neurology. The publication made its first appearance in January.

The Federal Security Agency has announced 166 Public Health Service grants-in-aid for mental health training, which total almost $2,000,000, and will aid in the expansion of teaching programs in medical schools, universities and other training centers. The following institutions in the District of Columbia will receive grants under the plan: Georgetown University, $12,500; American Psychological Association, $8,000; Catholic University of America, $90,920; George Washington University, $19,412; Howard University, $42,905; St. Elizabeths Hospital, $4,400; and Washington-Baltimore Psychoanalytic Society, $6,480. Georgetown and Howard Universities have also received grants from the National Heart Institute to aid in heart teaching.

Dr. James K. Shafer, Washington, has been appointed Assistant Chief in the Public Health Service's Division of Venereal Disease, to succeed Dr. Will H. Aufranc, now assigned to the National Security Resources Board's health resources office.

Applications for Damon Runyon Senior Clinical Research Fellowships are being accepted by the Committee on Growth of the National Research Council, acting for the American Cancer Society. Applications should be filed before March 1, 1951, with the Executive Secretary, Committee on Growth, National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C. They will be considered in April and the fellowships will begin July 1.

GEORGIA

The National Foundation of Infantile Paralysis has granted Emory University School of Medicine, Atlanta, a stipend of $10,460 to carry out research seeking improved methods of treating infantile paralysis. The project, part of a $1,590,990 program of the Foundation, will be directed by Dr. Robert L. Bennett, Professor of Physical Medicine.

The Georgia Warm Springs Foundation, Warm Springs, is the recipient of a $12,750 grant from the National Foundation for Infantile Paralysis, which will be used to increase the number of skilled professional persons required in carrying out research and in providing adequate care of poliomyelitis patients. The fund is being administered by Dr. Robert L. Bennett of Emory University.

Dr. R. F. Reider, Senior Surgeon in Charge, Laboratory Training Services, Communicable Disease Center, U. S. Public Health Service, P. O. Box 185, Chamblee, has announced a schedule of Laboratory Training Courses to be given by the Center, from January 1 through December 31, 1951. Information and application forms may be obtained by writing to the Officer in Charge at the Center offices in Chamblee.

Dr. Richard P. Campbell, formerly of Rockmart and a graduate of the University of Georgia School of Medicine, has opened offices in the Hollingsworth Building, Fayetteville, for the practice of medicine.

Applications for scholarships recently established in honor of Dr. James E. Paullin, Atlanta, are being accepted by Emory University School of Medicine, Atlanta, Dr. R. Hugh Wood, the Dean, recently announced. The first awards are for the 1951-1952 school sessions and are planned largely to assist students during their second and third year in medical school. Dr. Paullin retired last year from the Emory faculty after 42 years of service. He was professor emeritus of clinical medicine.

Dr. Marion Estes, Augusta, has resigned his position as associate professor of psychiatry and neurology at the Medical College of Georgia, Augusta, to accept an appointment as clinical director at Dix Hospital, Raleigh, North Carolina. Dr. Estes' work at the Medical College of Georgia will be carried on by Dr. Hervey Cleckley, Augusta, head of the department of psychiatry and neurology, and Dr. Corbett H. Thigpen, assistant professor of psychiatry and neurology. Dr. Estes has just passed the examinations of the American Board of Psychiatry.

Dr. Charles B. Fulgham, Milledgeville, recently took a special course at the medical center at Duke University School of Medicine, Durham, North Carolina.

The Georgia Chapter of the American Academy of General Practitioners met recently in Macon and elected the following

Continued on page 56

"UNUSUAL FOOD"

"The possibilities of yeast as human food deserves more technological attention. Two major defects in many modern diets are relatively small provision of certain vitamins of the B complex and insufficiency of biologically superior protein. Both deficiencies could be limited by using yeast as food."*

VITA-FOOD, genuine brewers' yeast, supplies nearly 50% of nutritionally complete protein plus all of the vitamin B complex factors.

*Wilder & Keys, "Handbook of Nutrition," A. M. A. 1943, Chapter entitled "Unusual Foods."

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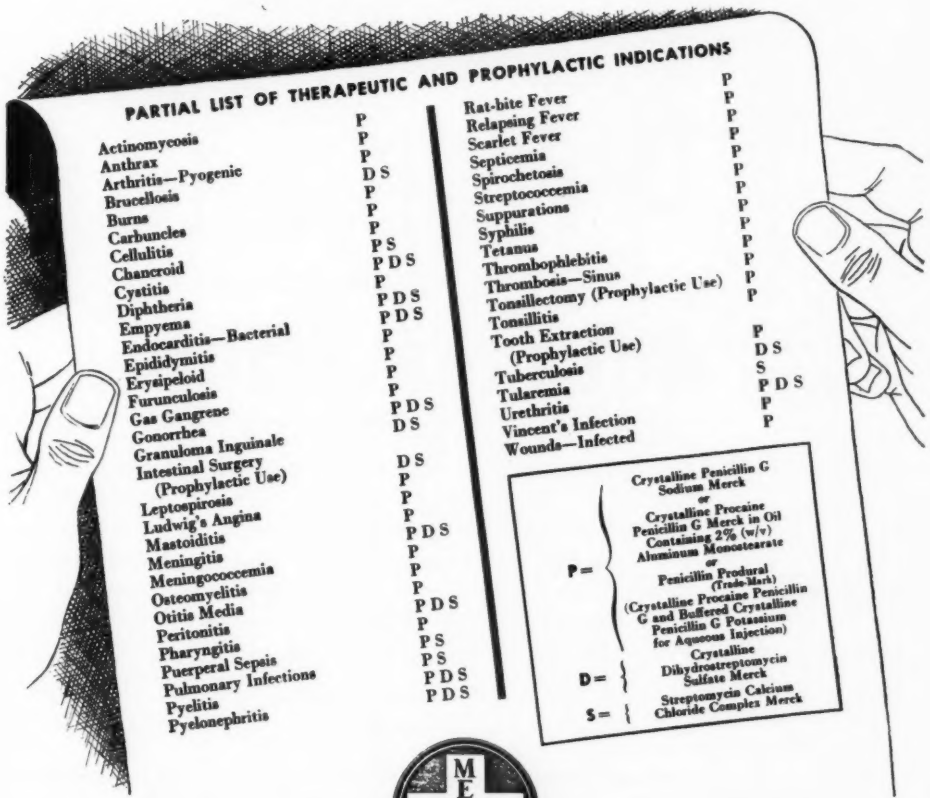
Merck Antibiotics . . .
A Roll Call of Effective Uses

MERCK ANTIBIOTICS—with their clinical efficacy *firmly established* in a wide range of infections—are indispensable tools of modern therapy. As a pioneer and leading producer in this field, Merck has developed antibiotics of unexcelled purity. The superior qualities of these products have served to increase and extend the usefulness of antibiotic therapy.

Below is a partial list of the many conditions in which these products may be indicated. The symbols D, P, and S are used to designate the antibiotics which are likely to be useful in most cases of the conditions specified. The particular agent to be employed will, of course, depend upon the nature of the disease process and the specific susceptibility of the infecting micro-organism.



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for True

Hypochromic Anemia

in Children

there is nothing better than

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MOLYBDENIZED FERROUS SULFATE

Investigators stated: "We have never had other iron salts so efficacious . . . our results have been striking . . . increases in hemoglobin were dramatic and rapid . . ."

White's Mol-Iron has been carefully evaluated in the treatment of iron-deficiency secondary anemia. It has proved to be more effective than unmodified ferrous sulfate[1,2,3] and exceptionally well tolerated.[4,5]

Supplied: Mol-Iron Liquid—bottles of 12 fluid ounces.

Also Mol-Iron Tablets—bottles of 100 and 1000.

NEW: **Mol-Iron with Liver and Vitamins (capsules) in bottles of 100.**
Mol-Iron with Calcium and Vitamin D (soft gelatin capsules) in bottles of 100.

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1. Dieckmann, W. J., and Priddle, H. D.: Am. J. Obstet. & Gynec. *57*:541 (1949). 2. Chesley, R. F., and Annitto, J. E.: Bull. Margaret Hague Mat. Hosp. *1*:68 (1948). 3. Dieckmann, W. J. et al.: Am. J. Obstet. & Gynec. *59*:442 (1950). 4. Kelly, H. T.: Pennsylvania M. J. *51*:999 (1948). 5. Neary, E. R.: Am. J. Med. Sc. *212*:76 (1946).

TO RELIEVE PREMENSTRUAL TENSION

MENSALIN

TRADEMARK

BRAND OF PYRANISAMINE BROMOTHEOPHYLLINATE

Tablets Walker

50% OF THE AVERAGE WOMAN'S MONTH MAY CONSIST OF DAYS WHEN SHE IS NOT AT HER BEST!

PREMENSTRUAL TENSION, characterized by a varying degree of physical and/or mental incapacity[1,2] ..10 to 14 days

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Total 15 to 19 days

INCREASE THE GOOD DAYS WITH MENSALIN*,

a new chemical combination which provides effective, safe relief of premenstrual symptoms such as nervous tension, breast tenderness, abdominal distention, low-back pain, and headache, in a majority of patients. **MENSALIN** is believed to act by combating edema, the probable cause of premenstrual molimina.[1]

MENSALIN has also been successfully used in preventing motion sickness.

SUPPLIED: Bottles of 30 and 100 tablets, each containing 50 mg. of pyranisamine bromotheophyllinate.

1. Hamblen, E. C.: Endocrinology of Woman. Springfield, Ill., Charles C Thomas, 1945; p. 468.
2. Gillman, J.: J. Clin. Endocrinol. 2: 157 (1942).

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Continued from page 52

officers: Dr. Walter W. Daniel, Atlanta, President; Dr. J. B. Kay, Byron, Vice-President; Dr. Albert R. Bush, Hawkinsville, Secretary-Treasurer; and Directors, Dr. Steve P. Kenyon, Dawson; Dr. Lee E. Williams, Cordele; Dr. Frank Vinson, Fort Valley; and Dr. Edwin W. Turner, East Point.

Dr. Wood Goss has announced the removal of his offices from Richland to Ashburn, where he will practice medicine and surgery in association with his brother, Dr. C. C. Goss.

Dr. David Merren, Atlanta, has opened offices in Atlanta, practice limited to urology.

Dr. R. J. Mincey, Thomaston, has associated with Dr. R. L. Carter and Dr. T. A. Sappington, at the Clinic, Thomaston. He will limit his practice to obstetrics and gynecology.

The Polk County Health Department and the Public Welfare Department, Cedartown, have purchased the Hackney home on Main Street to be used as a Health Center.

Dr. Paul L. Rieth and Dr. E. B. Dunlap, Jr., Atlanta, have opened offices at 207 Medical Arts Building, Atlanta. Practice is limited to orthopedic surgery and fractures.

Dr. George Roach, Atlanta, is at the Harvard Medical School, Boston, Massachusetts, taking postgraduate work in diseases of the ear, nose and throat.

The Southern Section of the United States Chapter of the International College of Surgeons met at the Biltmore Hotel, Atlanta, January 11-13.

Dr. William Grover Skipper announces the opening of offices at Roberta for the practice of medicine.

Dr. Earl Atkinson Mayo, Jr., has opened offices for the practice of medicine at Richland.

Dr. T. V. Willis, Brunswick, has accepted the position of Chief Surgeon and Medical Director of the Allegheny Memorial Hospital, Sparta, North Carolina.

Dr. Steve Worthy, Carrollton, has been elected chief-of-staff and president of the Tanner Memorial Hospital medical staff, and succeeds Dr. D. S. Reese. Other officers are: Dr. E. V. Patrick, Vice-Chief-of-Staff and Vice-President; and Dr. H. L. Barker, Secretary and Treasurer.

Dr. Sandy B. Carter, Atlanta, is a contributing editor to *"Therapeutics in Internal Medicine,"* a new textbook edited by Dr. Franklin A. Kyser, Northwestern University School of Medicine, Chicago, Illinois.

The National Cancer Institute, United States Public Health Service, has awarded a $13,176 grant to Dr. William F. Friedwald, Atlanta, Professor of Bacteriology and Immunization, and Associate Professor of Medicine, Emory University School of Medicine, to do work in the study of viruses and tumors.

Dr. R. Mitchell Sealy, Atlanta, is at present completing the requirements for residency for the American College of Surgeons at the University of Michigan Hospital, Ann Arbor, Michigan.

Dr. Robert C. Major, Augusta, is a Lieutenant Colonel in the U. S. Army, and is stationed in the Fitzsimmons General Hospital, Denver, Colorado.

Dr. I. Elizabeth Fletcher, Statesboro, has accepted a position as school physician of the Fulton County Health Department, Atlanta.

Dr. Donald R. McRae, Jr., Augusta, has opened offices in Augusta, for the practice of surgery.

The Atlanta Graduate Medical Assembly will meet in the Municipal Auditorium in Atlanta, February 5-7.

The Georgia Society of Ophthalmology and Otolaryngology will hold its annual meeting at the General Oglethorpe Hotel in Savannah, Georgia, March 2 and 3, 1951.

KENTUCKY

Dr. Guy Aud, Louisville, has been elected President of the American Cancer Society, to succeed Dr. Alton Ochsner, New Orleans, Louisiana, who has been elected President of the American College of Surgeons. Dr. Aud, a professor of clinical surgery at the University of Louisville School of Medicine, is past president of the Kentucky State Medical Association.

Dr. Elmer L. Henderson, Louisville, President of the American Medical Association, was recently installed as President of the World Medical Association at the fourth annual session of the association held in New York.

Dr. C. C. Howard, Glasgow, announced recently that the Rural Kentucky Medical Scholarship fund has approved loans to eight Kentuckians to help finance their medical education. Those receiving loans are: Ollie B. Emerine, Vine Grove; L. C. McLoud, Jr., Jenkins; Proctor C. Rankin, Monticello; Robert R. Smither, Owenton; Jimmie Tulloh, Glasgow; David R. Upton, Munfordville; Jack Kelley, Monticello; and Norman Kieth Kirby, Burkesville.

A new $12,000 laboratory trailer fully equipped to take pollution tests along the Ohio River as part of a six-state survey has been acquired by the State Health Department, Louisville.

Dr. Kenneth C. D. Hickman (Ph.D.), of the Eastman Kodak Company, spoke recently to the Kentucky Division of the American Cancer Society on "Time and the Cancer Problem."

Continued on page 60

POSTGRADUATE COURSE

In

CARDIOLOGY

Emory University School of Medicine

March 5-9, 1951 **Registration Fee $40.00**

The course is designed for those with special interests in cardiology and for those internists who wish to secure further preparation in the field.

Emphasis will be placed upon the physiological and pathological basis of cardiovascular disturbances and the therapeutic approach to them. The course is offered by the faculty of Emory University School of Medicine. Dr. Paul D. White, Clinical Professor of Medicine, Harvard University School of Medicine, and Dr. Eugene A. Stead, Professor of Medicine, Duke University School of Medicine, will be guest speakers.

Send requests for enrollment to:

Director of Postgraduate Education
Emory University School of Medicine

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3. Helping to overcome depressive states which frequently are responsible for overeating
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Desyphed is also a valuable agent to counteract drug drowsiness (antihistaminics, sedatives), to overcome mild depressive states and narcolepsy, and to counteract hypotension.

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dosage: The average adult dose of Desyphed for the treatment of obesity is one 2.5 mg. tablet one hour before breakfast and lunch daily. Another tablet may be taken in the middle of the afternoon if needed, provided it does not cause insomnia.

Available in tablets of 2.5 mg., bottles of 100 tablets.

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New LOW PRICES

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A Substantial Saving to Your Patients Receiving....

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IN THE TREATMENT OF HYPERTENSION

The excellent acceptance accorded Veriloid by the profession, and the construction of expanded manufacturing facilities have made possible a substantial reduction in the price of this unusual hypotensive agent.

TWO NEW POTENCIES

In addition to the formerly available 1 mg. tablet, Veriloid is now also available in 2 mg. and 3 mg. tablets. Based on former prices, the 1 mg. tablet represents a saving of 16⅔%, the 2 mg. tablet a saving of 25%, and the 3 mg. tablet a saving of 33⅓%.

After the optimal dose has been determined for the patient, the prescribing of the largest possible tablet size will result in the greatest saving. Literature describing the action, uses, and administration of Veriloid is available on request.

Veriloid, a purified biologically standardized extract of Veratrum viride, is now supplied in 1.0 mg., 2.0 mg., and 3.0 mg. scored tablets in bottles of 100, 500, and 1000. Available on prescription only at all pharmacies.

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Virtually Nonallergenic In Topical Antibiotic Therapy

The low sensitizing potentialities of bacitracin when applied directly to the skin and eyes make this antibiotic particularly suited to topical application. Bacitracin thus affords a means of combatting surface infections due to a wide range of pyogens with little if any risk of local reactions.

While the antibacterial spectrum of bacitracin is roughly that of penicillin, it offers the unique advantage of oftentimes being effective against organisms resistant to penicillin. Hence it frequently produces a favorable response when penicillin fails. Many pyodermias and other infections of the skin as well as superficial ocular infections due to gram-positive bacitracin-sensitive organisms yield to its action.

For local application to the skin and eyes, bacitracin is available as Bacitracin Ointment-CSC, and Bacitracin Ophthalmic Ointment-CSC.

BACITRACIN OINTMENT-CSC. Containing 500 units of bacitracin per gram of oleaginous base, this preparation is indicated in the treatment of impetigo contagiosa, and a host of other pyodermias and cutaneous infections due to gram-positive organisms, as well as in secondary infection in scabies, eczema, and other dermatologic lesions. Available in ½ and 1 ounce tubes, and in 4 ounce tubes for hospital use.

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BACITRACIN OPHTHALMIC OINTMENT-CSC. This formulation also provides 500 units of bacitracin per gram. It is indicated in acute and chronic conjunctivitis, blepharoconjunctivitis, and other superficial ocular infections due to gram-positive organisms. Supplied in ⅛ ounce tubes.

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1. *Tube Generated Cutting Current.*
2. *Spark-Gap Generated Coagulation Current.*
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5087 Huntington Dr., Los Angeles 32, Calif.
Please send me, by return mail, free brochure on the portable Blendtome Electrosurgical Unit.

Dr. _____

Street _____

City _____ State _____

Continued from page 56

Dr. Harold M. Kelso, Louisville, resigned recently as director of county health work of the State Department of Health to assume his former position of assistant city health officer, Knoxville, Tennessee.

Dr. Carl C. Howard, Glasgow, was re-elected Chairman of the State Medical Research Commission, November 16.

A remodeled wing of the Louisville General Hospital has been named the John Walker Moore Clinic in honor of Dr. Moore, retired dean of the University of Louisville School of Medicine.

LOUISIANA

Dr. Wiley R. Buffington, Emeritus Professor of Ophthalmology of the Tulane University School of Medicine, ex-member of the Council and ex-chairman of the Section on Ophthalmology and Otolaryngology, Southern Medical Association, died on November 30, 1950. He practiced in New Orleans thirty-two years and was recognized nationally in ophthalmology, especially in the difficult field of retinal detachment surgery. After he resigned from active Professorship of Ophthalmology at Tulane, he continued as the Surgeon-in-Charge of the New Orleans Eye, Ear, Nose and Throat Hospital until several months prior to his death. He was the consultant in ophthalmology at four major New Orleans hospitals.

The New Orleans Graduate Medical Assembly will meet in New Orleans, March 5-8, 1951. Dr. Woodard D. Beacham, New Orleans, is Secretary. A postclinical tour of South America is planned.

The Executive Committee of the State Medical Society has elected Dr. William A. Gillaspie, New Orleans, as outstanding general practitioner of Louisiana for 1950. The society has recommended to the Board of Trustees of the American Medical Association that he be considered for national recognition as the outstanding general practitioner of the year.

A building fund campaign for The Crippled Children's Hospital, which will serve children from the entire state and be located in New Orleans, was opened recently.

Surgical Association of Louisiana at a meeting of the association held in New Orleans, elected Dr. James Q. Graves, President; Dr. James Rives, First Vice-President; Dr. Jeff D. McHugh, Second Vice-President; Dr. Henry G. Butker, Secretary; and Dr. E. L. Leckert, Treasurer.

Drs. Dominic S. Condie, Paul T. DeCamp, Paul L. Getzoff, and Jack Wickstrom, all of New Orleans, were admitted to the American College of Surgeons recently.

Dr. F. L. Jaubert, New Orleans, has been re-elected President of the Louisiana Society for Crippled Children.

The American College of Surgeons has named Dr. Alton Ochsner, New Orleans, the William Henderson Professor of Surgery in the Tulane University School of Medicine, President for the years 1951-1952.

Dr. Ernest Carroll Faust, Professor of Tropical Diseases and Hygiene in the Tulane University School of Medicine, New Orleans, has been appointed to the editorial board of *Experimental Parasitology*, a newly established publication.

Dr. C. L. Eshleman, New Orleans, is the newly elected president of the Boston Club.

Dr. Edwin L. Zander, New Orleans, has been elected chairman of the newly formed Medical Committee of the New Orleans Chamber of Commerce.

The American Society of Tropical Medicine recently elected Dr. W. A. Sodeman, New Orleans, chairman of the department of tropical medicine and public health in the Tulane University School of Medicine, President-Elect. He will take office in January, 1952.

A $15,000 grant from the Edward G. Schlieder Educational Foundation has been given to the Tulane University School of Medicine, New Orleans, to develop and encourage the nurse training program there.

Dr. William B. Clark, New Orleans, professor and chairman of the Department of Ophthalmology in the Tulane University School of Medicine, has been appointed to the advisory council for ophthalmology of the American College of Surgeons.

MARYLAND

Dr. Bacon F. Chow, of the Johns Hopkins University School of Public Health, Baltimore, has received a $5,000 grant-in-aid from the National Vitamin Foundation, for the study of vitamin B_{12} as growth factor in man.

The Johns Hopkins University School of Hygiene and Public Health, Baltimore, has received a grant of $4,787 from the National Foundation for Infantile Paralysis to carry out investigations dealing with virus research. The project will be under the direction of Dr. Roger M. Herriott, Professor of Biochemistry.

The University of Maryland School of Medicine and College of Physicians and Surgeons, and the Johns Hopkins University School of Medicine, Baltimore, are cooperating in a statewide program of assistance to epileptic children which was begun recently under a special grant to the Maryland Health Department by the Chil-

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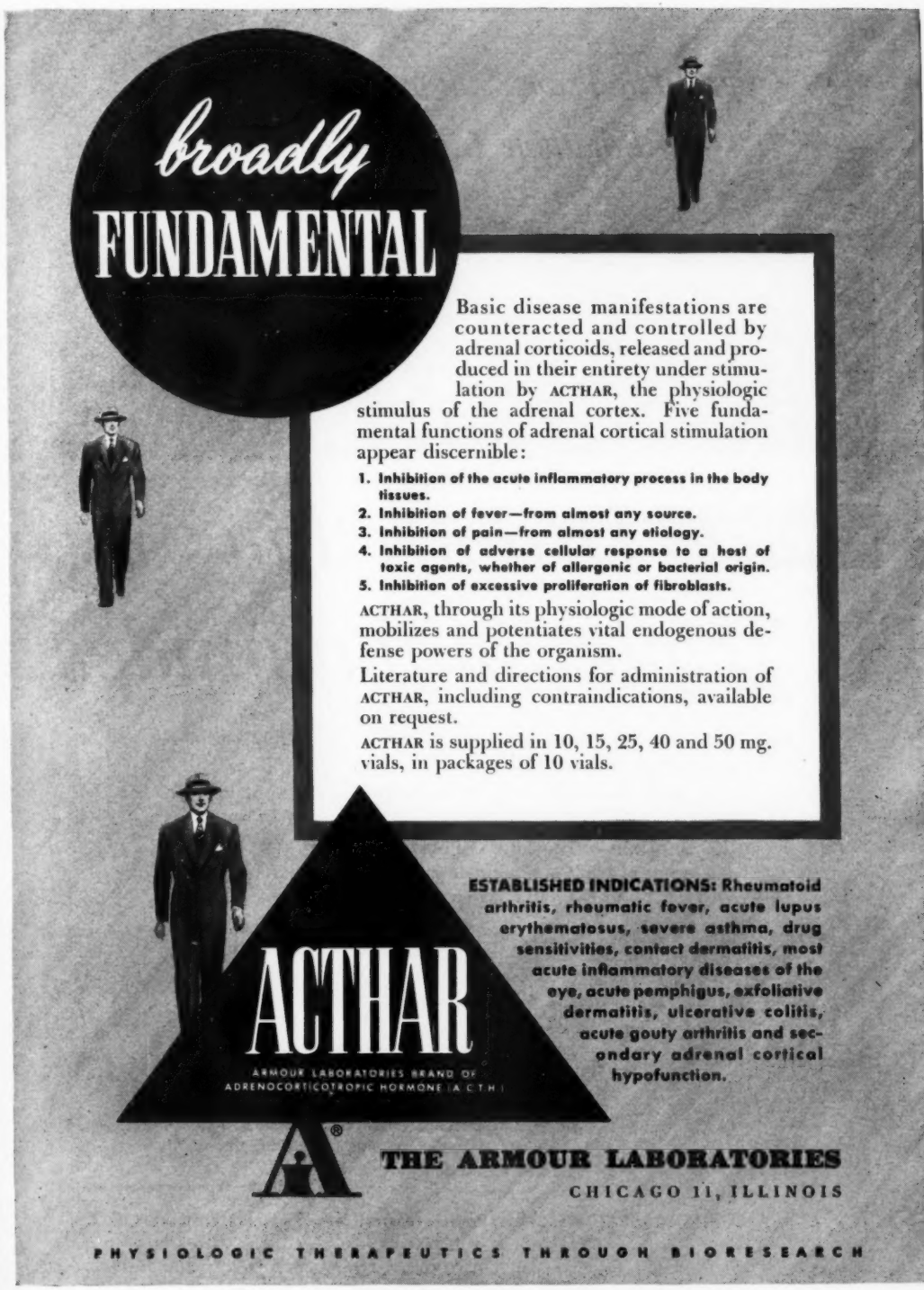
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Basic disease manifestations are counteracted and controlled by adrenal corticoids, released and produced in their entirety under stimulation by ACTHAR, the physiologic stimulus of the adrenal cortex. Five fundamental functions of adrenal cortical stimulation appear discernible:
1. Inhibition of the acute inflammatory process in the body tissues.
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ACTHAR, through its physiologic mode of action, mobilizes and potentiates vital endogenous defense powers of the organism.
Literature and directions for administration of ACTHAR, including contraindications, available on request.
ACTHAR is supplied in 10, 15, 25, 40 and 50 mg. vials, in packages of 10 vials.
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ARMOUR LABORATORIES BRAND OF ADRENOCORTICOTROPIC HORMONE (A.C.T.H.)
ESTABLISHED INDICATIONS: Rheumatoid arthritis, rheumatic fever, acute lupus erythematosus, severe asthma, drug sensitivities, contact dermatitis, most acute inflammatory diseases of the eye, acute pemphigus, exfoliative dermatitis, ulcerative colitis, acute gouty arthritis and secondary adrenal cortical hypofunction.
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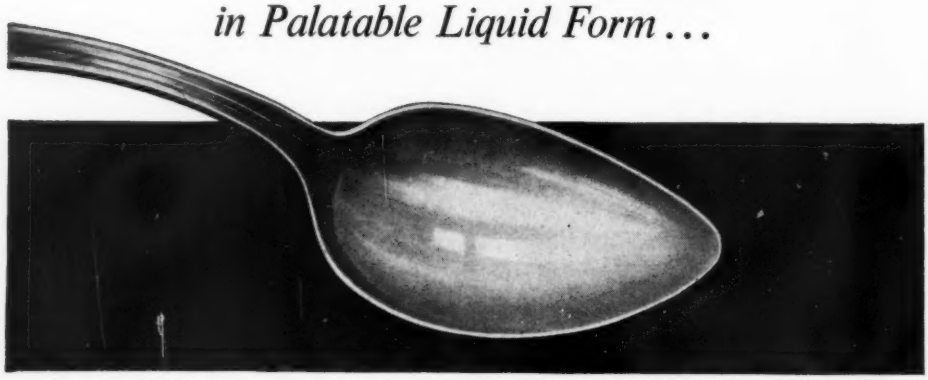
PHYSIOLOGIC THERAPEUTICS THROUGH BIORESEARCH

Penicillin-Triple Sulfonamide Mixture
in Palatable Liquid Form . . .



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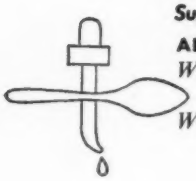
White's *Dram-cillin with*
Triple Sulfonamides

—in pleasant-tasting, convenient liquid form, readily acceptable to infants, children, adults.

White's Dram-cillin with Triple Sulfonamides, contains, per teaspoonful (5 cc.):
100,000 Units of Penicillin G Potassium and
0.5 grams of triple sulfonamide mixture: equal parts of
Sulfadiazine Sulfamerazine
Sulfacetimide (buffered)

Greater Safety—Oral penicillin appears less likely to produce hypersensitivity reactions.[1] Combined sulfonamides permit smaller, safer dosage of each[2]—offer less likelihood of crystalluria.

Supplied: In 60 cc. bottles



ALSO AVAILABLE: Potent Oral Penicillin for All Age Groups

White's Drop-cillin: 50,000 units* in a dropperful.
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White's Dram-cillin: 100,000 units* in a teaspoonful.
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Both with a delicious vanilla flavor.

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1. Keefer, C. S.: Amer. J. Med. *7*:216 (1948).
2. Kolmer, J. A.: Amer. J. Med. Sc. *215*:136 (1948).

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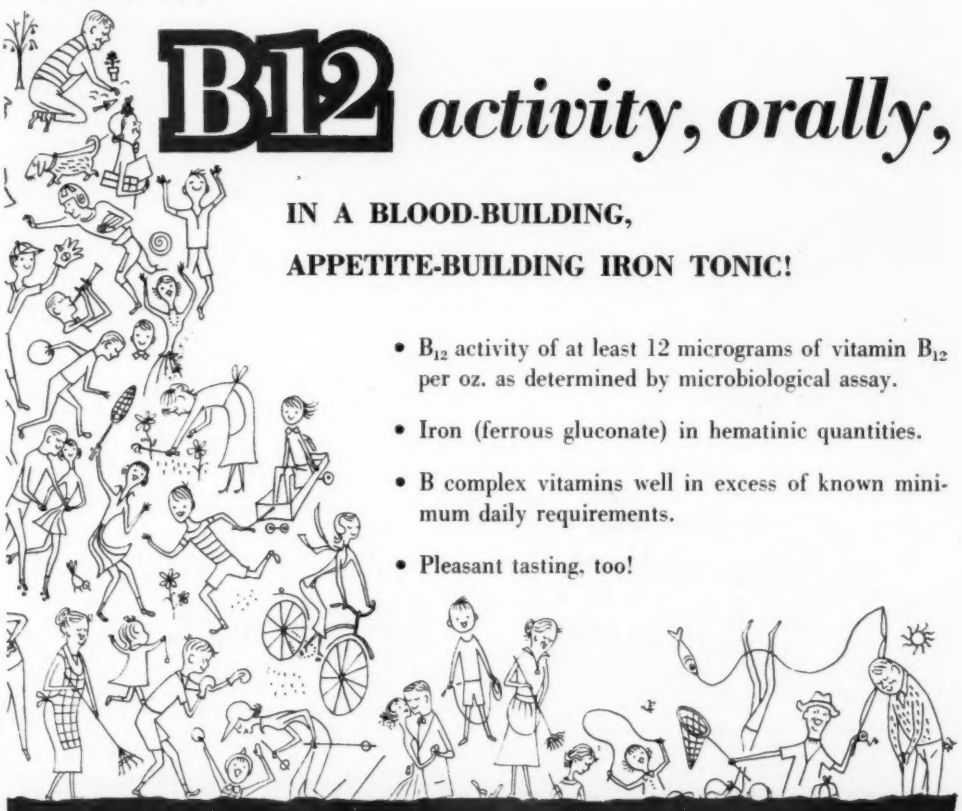
- B complex vitamins well in excess of known minimum daily requirements.
- Pleasant tasting, too!



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IRON B COMPLEX WITH B_{12} ACTIVITY

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Continued from page 60

dren's Bureau of the Federal Security Agency. County health departments will also take an active part in the program.

Dr. Royd R. Sayers, formerly with the U. S. Public Health Service, has accepted a part time post with the Baltimore City Health Department which was established by the Board of Estimates to strengthen the city's control of occupational diseases.

Dr. E. Cowles Andrus, Baltimore, was installed as President of the American Society for the Study of Arteriosclerosis at its November meeting in Chicago.

MISSISSIPPI

Dr. Jim C. Barnett is now practicing in Hazlehurst.

New hospitals were recently opened in Starkville and Tunica.

The Mississippi State Medical Education Board has announced that applications for state medical education loans, which enable Mississippi citizens and residents to enter and complete medical school, may be received after March 1, 1951. The loans are to become effective in the summer and fall of 1951.

MISSOURI

The St. Louis Medical Society elected Dr. Leroy Sante President at its annual elections November 25, 1950. Other officers elected are: Dr. Leon F. Weyerich, First Vice-President; Dr. Harry I. Berland, Second Vice-President; Dr. Joseph E. Von Kaenal, Secretary; Dr. Armand D. Fries, Dr. Sam J. Merenda, Dr. Bernard L. Sinner and Dr. Robert C. McElvain, three year term councilors; Dr. Louis H. Kohler, two year term councilor; and Dr. Grey Jones, one year term councilor.

The General Practitioners Study Club of Greater St. Louis will hold its regular monthly meeting on February 21. The speaker will be Dr. Robert W. Bartlett, F.A.C.S., and his subject will be "The Differential Diagnosis and Treatment of Pain in the Right Upper Abdomen."

The Missouri Industrial meeting, under the auspices of the Missouri State Medical Association, will take place in St. Louis February 13, 1951.

The St. Louis Academy of General Practice will meet February 27.

Dr. Alfred Goldman, St. Louis, spoke on the subject of "Pleurisy with Effusion" at a postgraduate course in diseases of the chest, sponsored by the Southern Chapter of the American College of Chest Physicians in cooperation with the Vanderbilt School of Medicine, Nashville, Tennessee.

Washington University School of Medicine, St. Louis, has received a pledge for 6,000 shares of the capital stock of the International Shoe Company, valued at $240,000, from Mrs. Oscar Johnson, widow of the late shoe manufacturer. The sum is to be put with other gifts to construct a building to house the occupational therapy and physical therapy research laboratories of the University's planned rehabilitation center.

The American Cancer Society granted Washington University School of Medicine, St. Louis, the sum of $39,000 for continuation of the program of cancer teaching and research through August 31, 1951. The society also has given Washington University grants-in-aid totaling $36,992 and fellowships totaling $5,800, or a total of $81,792.

Dr. Walter G. Rice, formerly assistant director of Laboratories at Baylor University Hospital and instructor in clinical pathology at Southwestern Medical School of the University of Texas, Dallas, has been appointed assistant professor of pathology for the St. Mary's Group of Hospitals of the St. Louis University School of Medicine. Dr. Rice will work with Dr. Henry Pinkerton, director of the Department of Pathology at St. Louis, and Dr. Raymond O. Meuther, director of clinical pathology at the St. Mary's Group of Hospitals.

The St. Louis Society for the Blind has awarded the Leslie Dana Medal to Dr. William L. Benedict, Rochester, Minnesota, for outstanding achievement in the prevention of blindness. The medal is awarded annually by the Society.

NORTH CAROLINA

The 8th annual Watts Hospital Medical & Surgical Symposium will be held at Durham, Carolina Theater, February 14 and 15. The program will include two days of papers; a clinico-pathological conference; and two panel discussions, one on Headache and one on Respiratory Infections. An outstanding group of speakers will be assembled.

Duke University School of Medicine, Durham, has received a grant from the National Foundation for Infantile Paralysis to conduct research seeking improved methods of treatment. The grant, which totals $17,200, will be administered by Dr. J. E. Markee, Professor of Anatomy.

Continued on page 68

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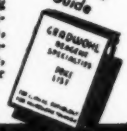

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SPERSOL (DOAK) is greaseless, stainless, odorless. Easily removed with water.

Indication: Ringworm of the Scalp (Microsp. Audouini or Lanosum)

Suggested Method of Treatment: Hair must be clipped every 10 days. Rub Spersol into the scalp nightly.

In 4 oz., 1 lb. and 5 lb. containers.

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NOW an entirely new approach to intranasal infections

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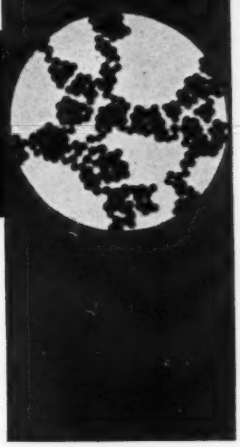

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Polymyxin (new) . . . . . **anti-gram negative**
Gramicidin . . . . . **anti-gram positive**

The antibacterial spectrum of Drilitol is extremely wide. And, because Drilitol is both bacteriostatic *and bactericidal*, infection is controlled much more rapidly than if it were only bacteriostatic.

Drilitol also contains an efficient antihistaminic, thenylpyramine, and an effective vasoconstrictor, Council-accepted 'Paredrine'* Hydrobromide.

Drilitol will help you reduce the duration, severity and complications of many common intranasal infections.

Dosage: Adults: Three or four drops (1 dropperful) in each nostril, 4 or 5 times a day, not oftener than once every 2 hours.

Children: ½ the adult dosage.

Available: In ½ fl. oz. bottles with special dropper that delivers the adult dose.

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All Children Can Benefit from *this Hot Drink at Breakfast*

The problem of encouraging children to eat an adequate breakfast finds easier solution when Ovaltine in hot milk is recommended as a breakfast beverage. Many children clamor for a hot drink at the morning meal and Hot Ovaltine is the right kind of drink to recommend.

A cup of Hot Ovaltine makes an excellent contribution of virtually all essential nutrients, adding substantially to the nutritional start for the day. It also serves in a gustatory capacity by enhancing the appeal of breakfast and making other foods more inviting.

The nutrient contribution made by a cup of Ovaltine is apparent from the table below. Note the wealth of essentials added to the nutritional intake by making the simple recommendation of adding a cup of Hot Ovaltine to the child's breakfast.

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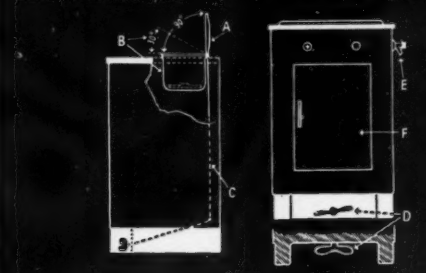
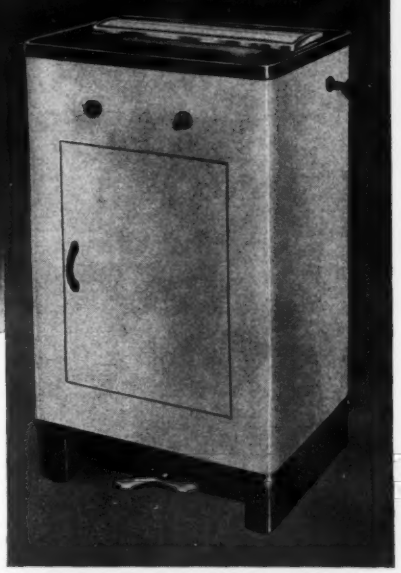
Here are the nutrients that a cupful of hot Ovaltine, made of ½ oz. of Ovaltine and 8 fl. oz. of whole milk,* provides:

PROTEIN	10.5 Gm.	IRON	4 mg.	NIACIN	2.3 mg.
FAT	10.5 Gm.	COPPER	0.2 mg.	VITAMIN C	10 mg.
CARBOHYDRATE	22 Gm.	VITAMIN A	1000 I.U.	VITAMIN D	140 I.U.
CALCIUM	370 mg.	VITAMIN B_1	0.39 mg.	CALORIES	225
PHOSPHORUS	315 mg.	RIBOFLAVIN	0.7 mg.		

*Based on average reported values for milk.

Ultra-Modern in every detail





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combine *exclusive* highlights in design and construction that insure greater operating safety, convenience and long periods of satisfactory service.

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(b) **Cover**—elevates to 30° angle before immersed tray starts to raise, thus enabling operator to observe water level at all times to insure immersion of instruments.

(c) **Cover Elevating Mechanism** — Concealed entirely within cabinet, thus allowing cabinet to be placed flush against the wall.

(d) **Recessed Foot Pedal**—Eliminates tripping annoyances and permits greater freedom of access for operator.

(e) **Drain Faucet**—a special screw-type valve which will not stick or score and may be taken apart instantly for cleaning without tools.

(f) **Doors**—Solid double-panel or glass, hung on fully concealed steel hinges, fitted with Bakelite handle, spring catches and rubber bumpers.

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An automatic safety measure protecting both Sterilizer and instruments against possible damage due to depletion of water supply in chamber.

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AMERICAN STERILIZER COMPANY
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Continued from page 64

The University of North Carolina School of Medicine, Chapel Hill, has announced that it received the following grants: $11,000 from the U. S. Public Health Service to continue a study of clotting defect in hemophilia, and $5,000 in support of a cancer teaching program to improve the teaching of pathology of neoplasms to medical students; Dr. K. M. Brinkhous received $2,900 from the Atomic Energy Commission, administered by the Red Cross, for a study of fractionation of blood; $5,500 to Dr. E. P. Hiatt from the National Heart Institute for a study of the effects of veratrum and cinchona alkaloids on the cardiovascular system; $13,250 to Dr. John H. Ferguson from the U. S. Public Health Service to continue blood coagulation research; $7,250 to Dr. A. T. Miller from the U. S. Public Health Service for studies on obesity as a physiological stress; $3,000 to Dr. Miller from the University Physical Education department to continue research on fatigue; $4,500 to the Department of Biological Chemistry from the U. S. Atomic Energy Commission to study the effect of fluoride, using radioisotope tracer technic, on the rate of deposition and exchange of calcium and phosphorus when gradient levels of fluoride and structural elements are administered; $3,000 to Dr. C. W. Hooker for the study of testicular tumors in mice and the problem of the nature of the tumor cell, from the Jane Coffin Childs Memorial Fund for Medical Research; $6,912 to Dr. Hooker from the U. S. Public Health Service for studies on the biosynthesis and metabolism of progesterone; $17,000 to Dr. C. D. VanClave and Dr. C. T. Kaylor from the U. S. Atomic Energy Commission to continue a radio-autographic study of the localization of radioberyllium in the tissues of the rat.

Dr. Frank R. Lock, professor of obstetrics and gynecology of the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, was elected to membership in the American Gynecologic Club which met in Boston last November.

Dr. Manson Meads and Dr. Charles Welfare, Bowman Gray School of Medicine of Wake Forest College, have been certified by the American Board of Internal Medicine.

North Carolina Radiological Society has elected Dr. J. T. Marr, Winston-Salem, President; Dr. J. Donald McRae, Asheville, Vice-President; Dr. Allen Tuggle, Charlotte, President-Elect; and Dr. James E. Hemphill, Charlotte, Secretary-Treasurer. The executive committee consists of Dr. G. W. Murphy, Asheville; Dr. G. B. Barefoot, Wilmington; Dr. Robert Reeves, Durham; Dr. Allan Tuggle, Charlotte; and Dr. J. D. McRae, Asheville.

Dr. Edgar S. Marks has opened offices for the practice of internal medicine in Greensboro.

Dr. Paul F. Whitaker, Kinston, has been elected to the North Carolina State Board of Medical Examiners, to fill the unexpired term of Dr. Paul G. Parker.

SOUTH CAROLINA

Dr. C. Conrad Smith, Chester, is at the New York University Medical School where he is doing postgraduate work in dermatology and syphilology.

Dr. Gertrude Holmes, Greenville, has been named Outstanding Professional Woman of the Year of Greenville.

Dr. Frederick E. Kredel, Charleston, has been elected to the Board of Governors of the American College of Surgeons.

Dr. O. L. Thomas, formerly of Greenwood, has announced the opening of offices in Ninety-Six for the practice of medicine.

Dr. Randolph C. Charles and Dr. Jennings K. Owens, Bennettsville, have associated for the practice of surgery, gynecology and obstetrics.

The Tri-State Medical Association of the Carolinas and Virginia will meet at the Columbia Hotel in Columbia February 19-20.

South Carolina Orthopedic Association, which was organized at a meeting in Columbia late last year, elected Dr. William A. Boyd, Columbia, President; Dr. Austin T. Moore, Columbia, Vice-President; and Dr. George R. Dawson, Jr., Florence, Secretary-Treasurer. Dr. Frank H. Stelling, Greenville, and Dr. Frank A. Hoshall, Charleston, were elected to the executive committee.

TENNESSEE

Dr. O. W. Hyman, Vice-President of the University of Tennessee Medical Units in Memphis, and Dean of the College of Medicine, was honored recently by the college faculty in recognition of his appointment to the National Science Foundation Board.

Dr. Hugh J. Morgan, Nashville, is a new member of the National Advisory Health Council of the U. S. Public Health Service.

Continued on page 72

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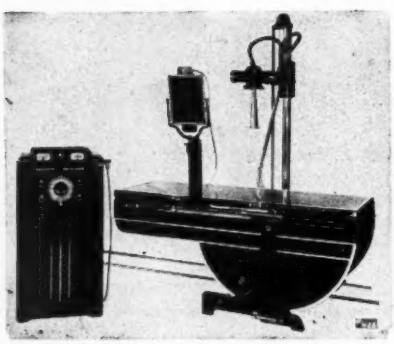

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Counterbalanced Bucky diaphragm runs on full-length track, has self-centering and locking device.

Screen and tube counterbalanced, travel in unison.

Counterbalanced fluoroscopic assembly is mounted on table chassis, has fingertip adjustment.

Push-button controls—automatic remote control operation of timers, electrical grid mechanism release.

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Many thousands of doctors, hospitals and clinics throughout the world have learned to respect the name "SANBORN" on diagnostic instruments. For they know from experience that their requirements are most completely fulfilled by apparatus bearing the SANBORN nameplate. They also recognize that a 33-year background has been so guided to give Sanborn Company leadership, not only in continually producing dependable precision instruments, but in developing many important "firsts" for the fields of cardiac and metabolism diagnosis.

Other manufacturers in like fields also show their recognition of Sanborn capabilities by following the Sanborn lead — to the extent, for example, that there is today a remarkable similarity in design and appearance between the Sanborn Viso-Cardiette and some of the "newer name" direct writing 'cardiographs.

Remember, the SANBORN nameplate is your only assurance that you are getting an electrocardiograph (or any of the other instruments made by Sanborn Company) that will surely meet all recognized standards. Once affixed to an instrument, the SANBORN nameplate becomes a signature to a guarantee of dependable and outstanding performance — a guarantee that is completely trustworthy though only "signed with a screwdriver."

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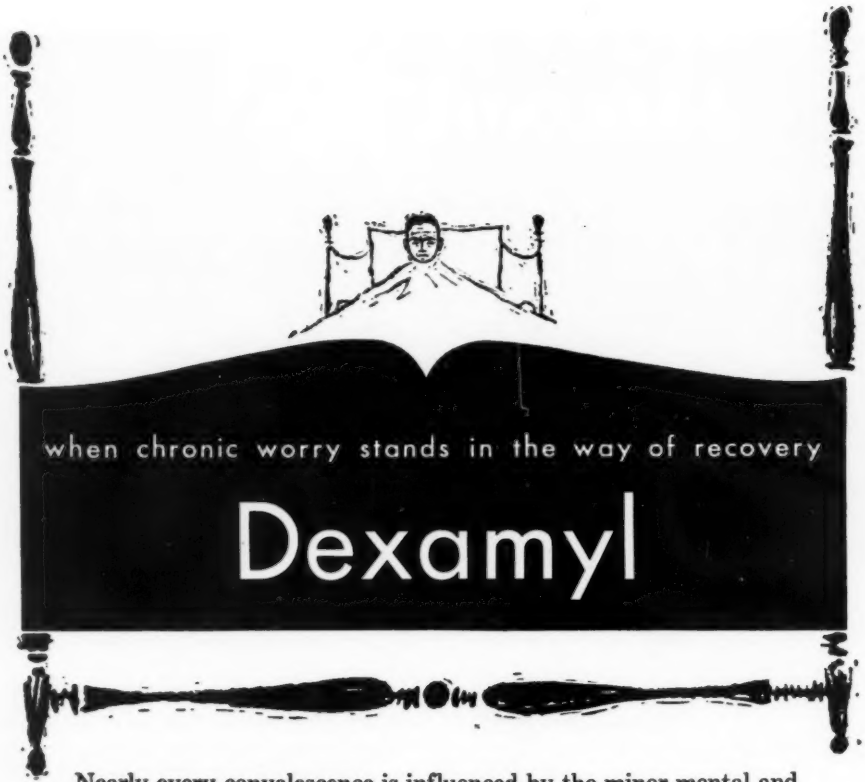

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To combat this problem you will find 'Dexamyl'*—a balanced combination of 'Dexedrine'* and Amobarbital, Lilly ('Amytal'†) —remarkably helpful.

The 'Dexedrine', because of its "smooth" and profound antidepressant action, restores mental alertness and optimism and dispels psychogenic fatigue.

The Amobarbital (Lilly), because of its tranquilizing effect, relieves nervous tension, anxiety and agitation.

'Dexamyl' tablets are available in bottles of 100 and 1000, on prescription only. Each tablet contains 'Dexedrine' Sulfate, 5 mg., and Amobarbital (Lilly), ½ gr. (32 mg.).

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Continued from page 68

Dr. O. S. Hauk, Superintendent of Central State Hospital, Nashville, has been elected President of the Southern Psychiatric Association.

Dr. John J. Lentz has begun another four-year term as Director of Health in Davidson County, a position he has held for thirty years.

Dr. J. C. Blankenship, Sparta, has been named temporary Assistant Superintendent of Davidson County Hospital. He has closed his offices in Sparta for the few months he will be with the hospital.

The Nashville Academy of Medicine and the Davidson County Medical Society have announced a new Public Service Program which provides for the establishing of a doctors' emergency service, making it possible for any member of the public to get a doctor at any time; the promotion of the enrollment of every doctor in Davidson County in the Tennessee Voluntary Health Plan; the establishing of a medical lay-service to assist in settling any misunderstandings between members of the medical profession and the public; the integration of the Academy of Medicine and the County Medical Society program with that of the Tennessee State Medical Association; the promotion of public relations; the promotion of high school student essay contests; the extension of availability of medical care in Davidson County; and the establishing of a speakers' bureau. Dr. Hollis E. Johnson is Chairman of the Public Services Committee.

TEXAS

Dr. O. Neal Miller of the University of Texas Medical Branch, Galveston, has received a stipend of $10,700 from the National Vitamin Foundation to carry out research on a study of the sprue-like syndrome (folic and deficiency) in the duckling. It is one of eight grants-in-aid given recently by the Foundation which total $60,700.

Three Texas Medical Schools have received grants from the National Foundation for Infantile Paralysis as part of the program for the continuation of research, professional education, and improved methods of dealing with the disease. The schools, which will do investigations dealing with virus research are: Southwestern Medical School of the University of Texas, Dallas, $13,450, under the direction of Dr. S. Edward Sulkin, Professor of Bacteriology; The University of Texas Medical Branch, Galveston, $15,350, under the direction of Dr. Morris Pollard, Associate Professor of Preventive Medicine and Public Health; and Baylor University College of Medicine, Houston, $16,110, under the direction of Dr. Russell J. Blattner, Professor of Pediatrics.

The International Postgraduate Medical Assembly of Southwest Texas, Fifteenth Annual Meeting, was held in San Antonio, January 23, 24 and 25, 1951, at the Municipal Auditorium.

The Texas Association of Obstetricians and Gynecologists will meet in Galveston February 9-10, 1951, under the Presidency of Dr. Howard Smith, Marlin.

The Texas Public Health Association plans a meeting in Galveston for February 18-21, 1951, to be led by Mr. Barnie A. Young, President.

The Texas Society of Mental Health will meet in Galveston March 8-9, 1951, under the leadership of Dr. Hamilton Ford, Galveston, President.

The Texas Society of Pathologists met in Galveston last month, with Dr. Charles Phillips, Temple, as President.

The Dallas Southern Clinical Society will meet in Dallas, March 28-29, 1951.

Dr. G. V. Brindley, Temple, was elected to a three-year term on the board of governors of the American College of Surgeons at its meeting in Boston last October. Dr. Helmuth Jack Ehlers, Houston, was elected to a two-year term on the board.

The University of Texas Medical Branch, Galveston, has received nearly $8,000 in grants for research and gifts for equipment recently: $2,212 from the Cabot Carbon Company, Pampa; $2,666 from the American Cancer Society; $4,515 from the Life Insurance Medical Research Fund; $600 from the Upjohn Company; and an $800 machine for the Rehabilitation Clinic from Max Baum, Galveston.

Dr. William F. Mengert, Dallas, is the new secretary of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons.

Dr. R. Lee Clark, Jr., Director of the M. D. Anderson Hospital for Cancer Research, Houston, was elected a Director of Region 7 of the American Cancer Society recently.

Dr. Robert E. Slade, Longview, has been elected Chairman of the regional committee of the Texas Public Health Association.

Dr. Roger J. Williams (Sc.D.), University of Texas, has been chosen the 1950 winner of the Southwest Award of the American Chemical Society, the award being a bronze plaque and $200. Dr. Williams, widely known for his work in the field of vitamins, has been Director of the University of Texas Biochemical Institute since 1940, and serves on the Food and Nutrition Board of the National Research Council.

Continued on page 74

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Continued from page 72

VIRGINIA

The second in a series of seven sectional meetings of the American College of Surgeons will be held in Hot Springs, February 26 and 27. Physicians who are not fellows of the college may attend the meetings.

Dr. C. D. Nofsinger, Roanoke, has been elected Chairman of the Virginia State Section of the American College of Physicians, and Dr. James F. Waddill, Norfolk, has been re-elected Secretary-Treasurer.

The Virginia Academy of General Practice installed Dr. John O. Boyd, Roanoke, President-Elect; and has elected Dr. Ira L. Hancock, Creeds, President; Dr. Floyd Hobbs, Alexandria, Vice-President; Dr. Edward E. Haddock, Richmond, Secretary; and Dr. C. R. Titus, Bedford, Treasurer.

Virginia Orthopedic Society has elected Dr. Charles Frankel, Charlottesville, President; Dr. C. E. Keefer, Lynchburg, Vice-President; and Dr. Allen M. Ferry, Arlington, re-elected Secretary-Treasurer.

Virginia Pediatric Society has elected Dr. E. Berkeley Neal, Roanoke, President; Dr. E. L. Kendig, Richmond, Vice-President; and Dr. W. A. Mitchell, Newport News, Secretary-Treasurer.

The Virginia Urological Society has elected Dr. Roberts C. Bunts, Richmond, President; Dr. Roy Upchurch, Danville, Vice-President; and Dr. Warren W. Koontz, Lynchburg, was re-elected Secretary-Treasurer.

Dr. George Cooper, Jr., has been awarded the J. Shelton Horsley Award of the Virginia Division, American Cancer Society, as the Virginian who has made the most outstanding contribution in 1950 to the control of cancer.

Dr. Fred J. Wampler, formerly of Richmond and Luray, has been transferred to Paraguay as Chief of the Health and Sanitation Commission, from Lima, Peru, where he has been with the Institute of Inter-American Affairs.

Dr. Alfred P. Jones, Roanoke, has been elected to a three-year term on the Board of Governors of the American College of Surgeons.

The National Institute of Health has awarded Dr. Edwin Boyle of the University of Virginia Department of Medicine, Charlottesville, a postdoctoral fellowship for studies on the ultracentrifugal analysis of the blood in patients with atherosclerosis.

Dr. Walter O. Klingman, University of Virginia Department of Medicine, Charlottesville, has been appointed a member of the Board of Chief Consultants to the Medical Director of the Veterans Administration, representing the field of neurology.

The National Institute of Health has awarded Dr. Frank C. Curran, Associate Professor of Neurology and Psychiatry at the University of Virginia Department of Medicine, a grant for histochemical studies on inflammation and repair.

Dr. Carlton G. Holland, Charlottesville, is the new clinical director of the Western State Hospital at Staunton, succeeding Dr. Stuart C. Runkle, who has been recalled to active service with the Navy.

Dr. G. Earle Johnson has resigned as Superintendent of the DeJarnette State Sanatorium. He will go to Meridian, Mississippi, to head the Hoye Sanitarium, which he has purchased.

WEST VIRGINIA

West Virginia Heart Association has elected Dr. Raphael J. Condry, Elkins, President; Dr. James L. Wade, Parkersburg, Vice-President; Dr. John S. Pearson, Huntington, Secretary; and Mr. R. E. Plott, Charleston, Treasurer.

The house of delegates of the West Virginia State Medical Association has gone on record as favoring the establishment of a four-year school of medicine and dentistry as part of the West Virginia University. The resolution favoring the school was passed at a recent call meeting of the delegates, which was one of the most largely attended meetings ever held by the association.

Dr. Albert C. Esposito, Huntington; Dr. James T. Spencer, Jr., Charleston; and Dr. John H. Trotter, Morgantown, have been elected fellows of the American Academy of Ophthalmology and Otolaryngology.

Dr. C. W. Holcomb, Sutton, has associated with Dr. John F. Boling, Grantsville. He will continue the practice of general medicine and surgery at the Boling Clinic, Grantsville.

Dr. Harold H. Cashman, Hopemont, has resigned his position as health officer of District 4 with the State Department of Health, in order to return to graduate school.

Dr. J. W. Calvert, formerly of Matoaka, has opened offices in Bluefield, where he will practice dermatology and syphilology.

Dr. Truett V. Bennett, Elbert, has moved to Charlottesville, Virginia, where he will continue his practice.

Dr. F. Vivan Lilly, Rainelle, has moved to Beaver where he will continue in general practice.

Dr. Ralph Frazier, Madison, has moved to War, where he will engage in general practice.

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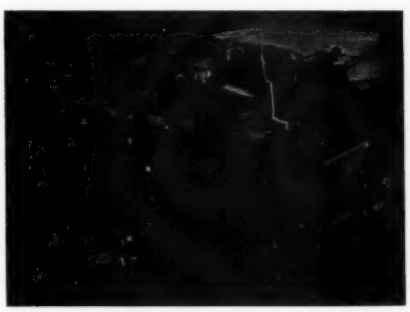

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Dr. Jerome W. Conn, Ann Arbor, Mich.
Endocrinology

Dr. H. Marvin Pollard, Ann Arbor, Mich.
Gastroenterology

Dr. John L. McKelvey, Minneapolis, Minn.
Gynecology

Dr. Arlie R. Barnes, Rochester, Minn.
Medicine

Dr. Cornelius P. Rhoads, New York, N.Y.
Medicine

Dr. George S. Baker, Rochester, Minn.
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Dr. Newell W. Philpott, Montreal, Can.
Obstetrics

Dr. John M. McLean, New York, N. Y.
Ophthalmology

Dr. Harold A. Sofield, Chicago, Ill.
Orthopedic Surgery

Dr. Henry B. Orton, Newark, N. J.
Otolaryngology

Dr. Stanley P. Reimann, Philadelphia, Pa.
Pathology

Dr. Albert V. Stoesser, Minneapolis, Minn.
Pediatrics

Dr. Paul C. Hodges, Chicago, Ill.
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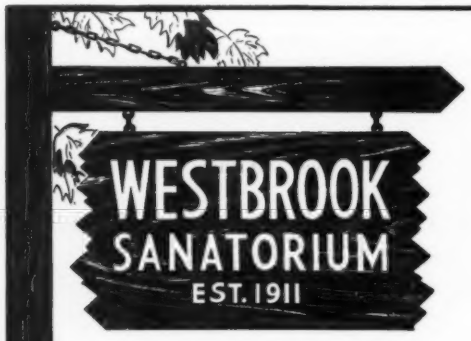

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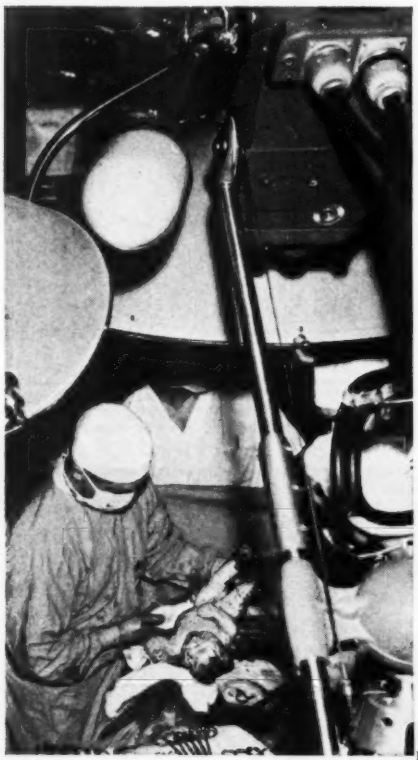

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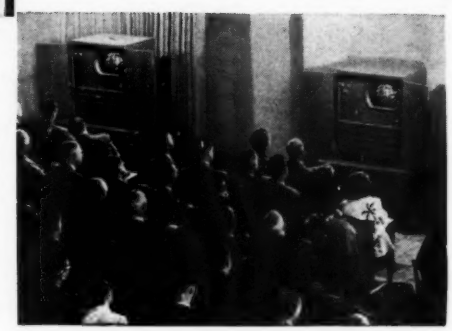

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